AMERICAN
STATISTICAL ASSOCIATION.

NEW SERIES, No. 79. SEPTEMBER, 1907.

THE DEWEY REPORT ON WAGES IN MANUFACTURING INDUSTRIES IN THE UNITED STATES.

By A. E. James.

I.

The Twelfth Census Special Report on Employees and Wages, which forms the subject of this article, is not, like the regular census publications, a summary covering the entire field of manufactures. As its name implies, it is a "special report," the result of a special investigation made under the direction of Professor Davis R. Dewey. For the sake of brevity and in appreciation of a report which marks a new departure and a long advance in American statistics of wages, it will be referred to in the following pages as the "Dewey Report."

Professor Dewey's investigation was limited to thirty-three manufacturing industries and to only a small proportion of the establishments in those industries. Thus wage statistics were secured for only a small part of the total number of wage-earners actually engaged in American manufactures. Table I shows the number of adult males engaged in all manufacturing industries from which the Dewey Report

gives statements of wages, the total number of adult males whose rates of wages were actually returned, and the per cent. which this last total is of the whole number in the industries investigated and of the total number in all manufacturing industries in the whole country for 1890–1900.

TABLE I.

ADULT MALE WAGE-EARNERS (*a*) IN THE UNITED STATES, (*b*) IN THE INDUSTRIES GIVEN IN THE DEWEY REPORT, (*c*) IN THE DEWEY REPORT ITSELF, AND WITH PERCENTAGES AS INDICATED.

Years.	(*a*) Number Employees in all Manufactures.	(*b*) Number Employees in Dewey Industries.	Percentage Employees in Dewey Industries to Total in all.	(*c*) Number Employees whose Rates were investigated.	Percentage.	
					c to *b*	*c* to *a*
1890	3,327,042	1,788,966	53.77	105,453	5.89	3.17
1900	4,110,527	2,232,509	54.31	160,859	7.20	3.91

As in all restricted investigations, we are here met at the outset with the question, Are these returns representative? Little more than half the total of all manufacturing wage-earners are included in the thirty-three industries, and of these the returns of wage rates were secured from only a small percentage of the total number of employees. Numbers, however, are an indifferent test. It would seem that an investigation which included 3 to 4 per cent. of all the wage-earners in manufactures in the country should give an excellent idea of manufacturing wages, as a whole. But in the first place the industries selected must cover the whole range of our national manufactures, and, more important still, must include those broadly typical of the whole. Table II gives a list of the industries from which data were secured by Professor Dewey, and the percentage of all employees in each industry whose wage rates were actually returned, 1890–1900.

TABLE II.

INDUSTRIES IN THE DEWEY REPORT AND PERCENTAGE OF ADULT MALE EMPLOYEES IN EACH INDUSTRY ACTUALLY RETURNED, 1890–1900.

Industries.	1890.	1900.
Textile industries:		
Carpet mills	5.59	6.10
Cotton mills	3.24	3.28
Knitting mills	1.89	2.17
Dyeing and finishing textiles	10.76	11.07
Woollen mills	8.51	11.35
Wood-working industries:		
Agricultural implements	10.38	25.90
Furniture	3.79	3.96
Lumber and planing mills	2.84	3.46
Pianos	6.76	9.69
Wagons and carriages	3.26	3.42
Metal-working industries:		
Car and railroad shops	4.34	5.05
Foundries and metal-working	10.14	11.27
Iron and steel mills	11.43	11.55
Shipyards	19.05	17.93
Miscellaneous industries:		
Bakeries	3.11	3.02
Breweries	10.59	9.54
Candy	3.16	3.61
Chemicals	27.77	25.09
Cigars	1.17	1.71
Clothing	.56	.89
Collars and cuffs	8.60	10.54
Distilleries	2.59	5.27
Flour mills	2.19	3.83
Glass	7.69	10.62
Paper mills	3.74	3.09
Potteries	2.61	1.66
Brickyards	.27	.40
Printing	2.79	2.41
Rubber	22.07	11.04
Shoes	1.50	2.39
Slaughtering	21.47	13.43
Tanneries	6.10	9.10
Tobacco	32.38	28.33

This list of industries seems to have been chosen with great care, and ought to be fairly representative of the whole manufacturing field. We have already seen (Table I) that the percentage of adult male wage-earners whose rates of

wages were actually investigated to the total number of wage-earners in manufactures was in 1890 3.17 per cent. and in 1900 3.91 per cent. So general an average as this is, however, likely to mislead. An investigation of a statistical nature is peculiarly liable to err, if the several parts are not in themselves representative. Data that are faulty not only are worthless in themselves, but carry their weaknesses through all summaries and into all results. Unlike mere mechanical errors of tabulation, these errors in collected data are unlikely to be self-correcting. It is, therefore, necessary that each of the various industries treated in the Dewey Report should have returns large enough to fairly represent that industry. Table II A is a summary for all the industries, showing the number of industries in each of several percentage groups and indicating in a general way to what extent the Dewey Report may be considered to be representative of all the industries investigated.

TABLE II A.

THE NUMBER OF INDUSTRIES GROUPED ACCORDING TO THE PERCENTAGE OF EMPLOYEES IN EACH WHOSE WAGE RATES WERE RETURNED.

Groups of Percentages.	1890.	1900.
All groups	33	33
Under 1%	2	2
1% to 1.99%	3	2
2 " 2.99	5	3
3 " 4.99	7	8
5 " 9.99	6	6
10 " 19.99	6	9
20% and over	4	3

Mr. Arthur L. Bowley, one of the greatest authorities on wage statistics in any country, attacked the report in a recent number of the *Royal Statistical Journal,* one of his points being that Professor Dewey had not reported as many as a thousand employees in several industries. But surely the only fair test is the percentile test already applied, and by

this test the Dewey Report seems in vastly the greater part to be sufficiently representative of each industry.

But quite as important as this is the question of geographical distribution. It will be remembered that the Aldrich Report was confined almost exclusively to New England and the Middle Atlantic States. This was clearly unfortunate. The economic sections of the country are widely different, and no report can possibly represent conditions or even relative changes without carefully considering each section in nearly its relative importance to the manufacturing wage-earning class. For the Dewey Report establishments of the various industries were selected from every section of the country, and it only remains to be seen whether more or less wage-earners were selected in any section than should have been to satisfy the requirements of reasonable accuracy. In Table III are given the percentages of the total number of wage-earners in the country distributed by sections as returned by the Census Report of Manufactures, Part I, and the percentage of the total number in the Dewey Report taken from each section.

TABLE III.

THE DISTRIBUTION OF ADULT MALE WAGE-EARNERS BY GEOGRAPHIC DIVISIONS.

Geographic Divisions.	1890.		1900.	
	Census Report.	Dewey Report.	Census Report.	Dewey Report.
United States	100.0	100.0	100.0	100.0
New England States	19.3	12.1	17.8	10.5
Middle States	38.5	36.4	37.2	36.0
Southern States	9.7	7.1	12.3	6.2
Central States	28.2	40.3	27.7	42.3
Western States	1.8	0.0	2.3	0.0
Pacific States	2.5	4.1	2.7	5.0

From this table it appears that, geographically considered, Professor Dewey's selection of wage-earners is only fairly rep-

resentative. The Middle States and the West, as a whole, are given proper weight, but New England and the Southern States are somewhat neglected, while the Central States are noticeably over-represented. The question immediately arises, has this defect in the selection of data appreciably influenced the results of the investigation? This question may be answered by a simple test. The Census of Manufactures provides us average wages in different sections of the United States, as follows:—

	1890.	1900.
New England States	$509.33	$507.12
Middle States	540.62	528.71
Southern States	364.83	334.96
Central States	470.84	488.51
Western States	565.91	577.09
Pacific States	620.39	577.11

These averages, though inaccurate for some purposes, are sufficiently accurate to show whether a general average based upon them and weighted by the actual proportions of wage-earners in the several sections of the country would differ materially from a similar general average weighted by the proportions which characterized Professor Dewey's selection. The results of this test (Table IV) show that in 1890 the average weighted according to the true proportions differs from the average weighted according to Professor Dewey's proportions by only ten cents. In 1900, however, the over-weighting of the Central Division is shown to have exercised an appreciable influence. It appears above that the only important manufacturing section of the country showing an increase is the Central States.

TABLE IV.

Weights.	1890.	1900.	Percentage of Excess.
Census proportions	$499.60	$492.32	Dewey over Census 1900, 1.53%
Dewey proportions	499.50	499.85	

In short, from these results it seems fair to conclude that Professor Dewey presents a somewhat too favorable picture of conditions in 1900.

Professor Dewey's investigation, while made in 1901–02, included two years within its scope; namely, 1890 and 1900. The method of securing the comparison was, briefly, this: The men engaged in field work were restricted in securing data to those industries and establishments which were in existence at both these dates. They then copied from the pay-rolls of these establishments the number of employees and their respective rates of wages in each year. This was done apparently upon the theory that the thing desired was an index of the *change* in wages. Any broad, general movement would doubtless be fully revealed by this method; but, if the thing which we would measure is the *social well-being of the laboring class*, is the method correct? Should not new establishments and new industries which arise be given their full representation? Doubtless their competition in the labor market will have its effect upon the industries and establishments already existing, but we cannot depend wholly upon the "fluidity" of labor. If our returns are to have any social meaning, if they are to fulfil the fundamental purpose of wage statistics, they must be for each year broadly representative, not merely of particular industries and establishments, but of manufactures as a whole. Therefore, the exclusion of any data necessary for the above purpose merely because it was not included at some prior date defeats the very object for which the investigation was made. In each year we must have returns broadly representative. Then we will let the comparisons take care of themselves. The Dewey Report, however, covered so broad a field and was so thoroughly representative in that field that this error probably had little influence upon the results obtained. That the idea itself was misconceived should, I think, clearly appear from the fact that, if rigidly and logically adhered to, it should be applied not merely to industries and establish-

ments, but also to occupations and individuals! Such a rule would, of course, be a practical impossibility. But suppose the present method be persisted in. In a few decades the constant changes of occupations, firms, and establishments, and even industries to which our manufactures are subject, would gradually exhaust all our available data. It may be suggested that in each census a comparative study may be made, covering, as did Professor Dewey's, two *census* years. I would answer, first, that such a study is expensive; second, that it is either useless or breaks the continuity of the statistics from decade to decade; and, third, that it is wrong in principle. The end to be attained is a true picture of wages in each decennial year, and all methods not necessarily conducive to that end are of doubtful value.

Finally, it has been frequently stated, and nowhere more emphatically than in the Census Reports, that the wages of skilled and unskilled workmen cannot be averaged, that no single index number or average can be obtained in which is summed up the whole condition and trend of wages, that comparisons of the whole wage-earning class from one period to another are necessarily based upon the assumption that there has been no change in the proportions of the skilled and unskilled. Professor Dewey opens his discussion with a quotation from Part I, page cxii, of the Census of Manufactures, in which is this statement: "An average obtained by dividing the number of wage-earners into the total amount of wages paid is misleading. The argument that such an average is serviceable for purposes of comparison from one period to another must presuppose that the proportion of skilled and unskilled labor at the two periods for which the average is returned remains substantially the same." This is doubtless true of an arithmetic average, but not because of the problem of handling statistics of skilled and unskilled wage-earners. It is not necessary here to treat of the weakness of the arithmetic average in wage statistics. But, when it is once obtained and used, why may not changes in the

proportions of skilled and unskilled enter into the calculations, just as any other cause which may bring about a general change in the rates of wages? Surely, if the welfare of the wage-earning class is the thing we are investigating, an increase or a fall in the demand for *skilled* workmen, any change in the proportion which they bear to the whole, is as much to be taken into account as the demand for labor itself or a change in the prosperity of the country.

II.

We have seen that the Dewey Report, while imperfect in some respects, is yet, on the whole, probably the most reliable report on wages in the United States. Its strength lies mainly in the two facts (1) that it is broadly extended over every kind of manufacturing and includes enough wage-earners to be representative, and (2) that the data are presented in practically their original form. Moreover, the averages obtained (the median and quartiles) are far preferable to a mere index number or arithmetic average which give no indication of the welfare of the various wage groups, no idea of changes in relative distribution, and no data from which these things may be computed. The great fault to be found with the Dewey Report, aside from the questions of method already treated, is that no final results were obtained in the investigation as a whole. Each industry was briefly summarized, and there the discussion stopped. The wage-earners in each industry were first divided into 50-cent groups of weekly wage rates, and then assigned to their particular occupational group. These were, in turn, gathered together by sections of the country, and finally a grand total found for the entire industry in the whole country. This summary was perfectly right. *So long as our data are preserved in their original form, or in small groups, it is immaterial to what extent we combine establishments or industries,* since it is the wage obtained, and not the nature of the work

done, which is of importance to us in dealing with wage statistics. This being the case, a final summary grouped as were all the others, showing the distribution of wage-earners in wage groups in all the industries for the whole country, might well have been obtained.

This, then, is the first thing to be done in a study of the Dewey Report, the object of which is to find the wages prevailing in manufacturing industries in the United States in 1890 and 1900. The method here used is simply that indicated above. The summaries for each industry as divided into wage groups are added together, thereby getting a grand total for all the industries covered by the report. Table V contains the results so obtained, with their cumulative and absolute per cents. for 1890 and 1900.

Where possible, a graphic representation of statistics is always desirable, as it brings out most clearly the essential points of the phenomena with which we have to deal. For the present purpose I have used a cumulative percentile curve, plotting upon one co-ordinate the cumulative per cents. given above and upon the other the wage groups to which they correspond. This curve has several advantages over other graphic methods for our particular purposes. In the first place the use of the cumulative per cents. locates automatically the median, quartiles, and other desired percentile points, and the curves for different years may be plotted together and their points of variation noted at a glance.

TABLE V.

SUMMARY FOR ALL INDUSTRIES. DISTRIBUTION OF ADULT MALE WAGE-EARNERS IN WAGE GROUPS.

Rates per Week.	1890.			1900.		
	Number.	Absolute per Cents.	Cumulative per Cents.	Number.	Absolute per Cents.	Cumulative per Cents.
Total	105,453	100.00	100.00	160,859	100.00	100.00
Under $2.00 . . .	30	.03	100.00	21	.01	100.00
$2.00 to $2.49 . . .	164	.16	99.97	108	.07	99.99
2.50 " 2.99 . . .	280	.27	99.81	484	.30	99.92
3.00 " 3.49 . . .	1,210	1.15	99.54	1,141	.71	99.62
3.50 " 3.99 . . .	1,132	1.07	98.39	1,535	.95	98.91
4.00 " 4.49 . . .	1,625	1.54	97.32	1,754	1.09	97.96
4.50 " 4.99 . . .	2,105	2.00	95.78	2,598	1.62	96.87
5.00 " 5.49 . . .	1,783	1.69	93.78	2,482	1.54	95.25
5.50 " 5.99 . . .	958	.91	92.09	1,416	.88	93.71
6.00 " 6.49 . . .	3,762	3.57	91.18	4,795	2.98	92.83
6.50 " 6.99 . . .	2,681	2.54	87.61	3,169	1.97	89.85
7.00 " 7.49 . . .	3,818	3.62	85.07	6,289	3 91	87.88
7.50 " 7.99 . . .	5,738	5.44	81.45	9,495	5.90	83.97
8.00 " 8.49 . . .	6,256	5.93	76.01	8,998	5.59	78.07
8.50 " 8.99 . . .	1,934	1.83	70.08	4,263	2.65	72.48
9.00 " 9.49 . . .	9,508	9.02	68.25	16,319	10.15	69.83
9.50 " 9.99 . . .	2,949	2.80	59.23	7,487	4.65	59.68
10.00 " 10.49 . . .	3,816	3.62	56.43	5,299	3 29	55.03
10.50 " 10.99 . . .	10,817	10.26	52.81	12,820	7.97	51.74
11.00 " 11.49 . . .	2,426	2.30	42.55	4,515	2.81	43.77
11.50 " 11.99 . . .	1,786	1.69	40.25	2,887	1.80	40.96
12.00 " 12.49 . . .	7,347	6.97	38.56	11,126	6.92	39.16
12.50 " 12.99 . . .	1,694	1.61	31.59	4,385	2.73	32.24
13 00 " 13.49 . . .	2,000	1.90	29.98	4,039	2.51	29.51
13.50 " 13.99 . . .	4,156	3.94	28.08	5,936	3.69	27.00
14.00 " 14.49 . . .	2,227	2.11	24.14	4,057	2.52	23.31
14.50 " 14.99 . . .	951	.90	22.03	2,004	1.25	20.79
15.00 " 15.49 . . .	5,099	4.84	21.13	7,560	4.70	19.54
15.50 " 15.99 . . .	834	.79	16.29	1,680	1.04	14.84
16.00 " 16.49 . . .	1,371	1.30	15.50	2,125	1.32	13.80
16.50 " 16.99 . . .	2,069	1.96	14.20	3,349	2.08	12.48
17.00 " 17.49 . . .	855	.81	12.24	1,437	.89	10.40
17.50 " 17.99 . . .	656	.62	11.43	1,173	.73	9.51
18.00 " 18.49 . . .	2,968	2.81	10.81	3,862	2.40	8.78
18.50 " 18.99 . . .	391	.37	8.00	612	.38	6.38
19.00 " 19.49 . . .	508	.48	7.63	655	.41	6.00
19.50 " 19.99 . . .	767	.73	7.15	970	.60	5.59
20.00 and over . .	6,782	6.42	6.42	8,014	4.99	4.99

Chart I contains the cumulative per cents. of 1890 and 1900, plotted in wage groups. The curve suggests (*a*) a slightly higher wage paid to the unskilled labor in the lower groups, and (*b*) quite as pronouncedly less to the better-paid workmen. These results are subject to two interpretations: (1) there may have been an actual rise and fall, as shown; or

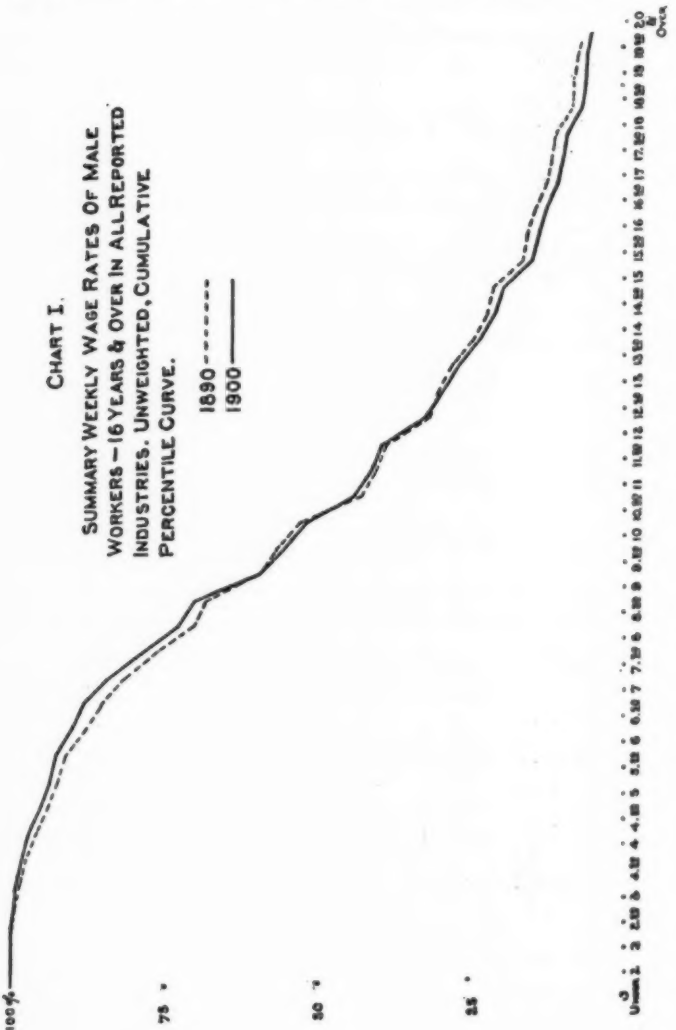


CHART I.
SUMMARY WEEKLY WAGE RATES OF MALE WORKERS — 16 YEARS & OVER IN ALL REPORTED INDUSTRIES. UNWEIGHTED, CUMULATIVE PERCENTILE CURVE.
1890 - - - - - -
1900 ——
100%
75 "
50 "
25 "
& OVER

(2) the wage of every wage-earner may have remained the same, and the new labor introduced have entered the lower groups. In either case the results are equally unfavorable for the workers as a class.

But this method of obtaining a summary of the Dewey Report is open to serious objection. Although we know that the returns for most of our industries are truly representative, and that those which are not may safely be left to the theory of probability when combined, as here, to make so large a base, yet, if we grant the reliability of our returns for each industry, when a total summary is obtained, as above, we do not know that it is either reliable or representative. For we have thus far paid no attention to the relative importance of the industries thus combined. We may have given any industry reported fully by Professor Dewey far too much weight and much too little to those from which he secured comparatively few returns. Thus in Table II we have already noted that the per cent. of each industry returned varies for adult males from 32.38 per cent. of tobacco to .27 per cent. of brickyards employees. If our results are to be correct, they must give to each industry its rightful weight in accordance with the total number of workmen employed therein as reported by the 1900 Census of Manufactures, page 1, for the years 1890 and 1900. In the Dewey Report the total number of adult males whose rates of wages were secured is given for the entire industry for each year, divided up among the various wage groups. In the following table the total number actually employed in each industry, as returned by the Census, have been divided in the same manner, giving to each wage group the same proportion of the total as it has in the Dewey Report. This having been done for all the industries for each year, a summary was obtained for all industries, as before. The distribution in the wage groups of each industry is thus exactly as in the Dewey Report, but the total obtained by adding the various industries both contains all the wage-

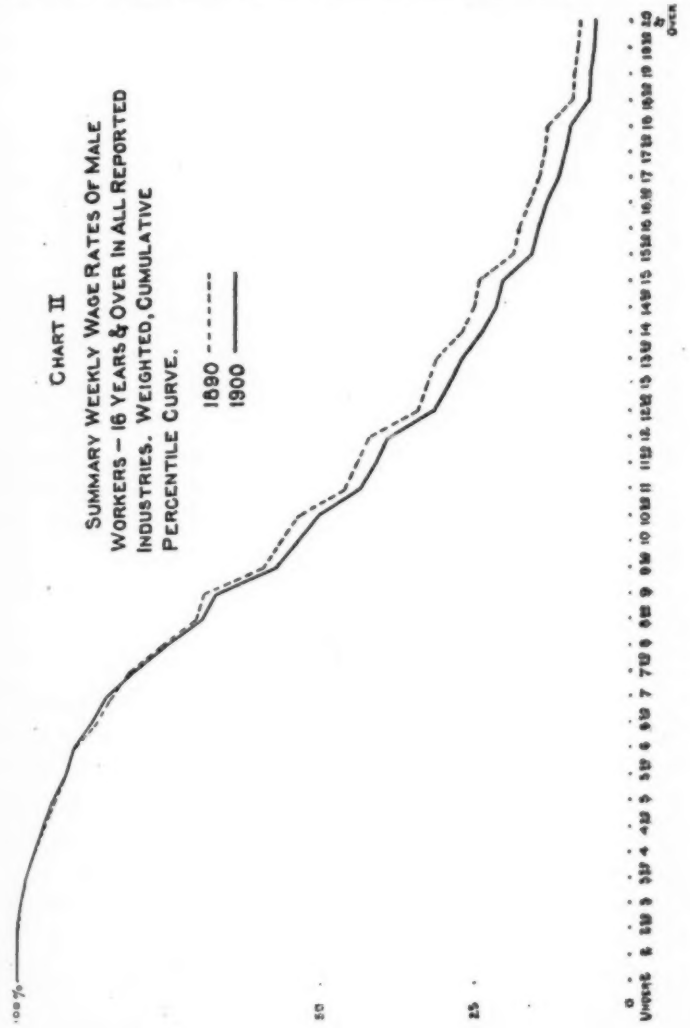
earners actually in those industries and gives to each industry its true weight.

TABLE VI.

DISTRIBUTION OF ADULT MALE WAGE-EARNERS IN WAGE GROUPS. DEWEY'S REPORT WEIGHTED.

Rates per Week.	1890.			1900.		
	Number.	Absolute per Cents.	Cumulative per Cents.	Number.	Absolute per Cents.	Cumulative per Cents.
Total	1,788,966	100.00	100.00	2,232,509	100.00	100.00
Under $2.00	503	.03	100.00	975	.04	100.00
$2.00 to $2.49	3,163	.18	99.97	3,330	.15	99.96
2.50 " 2.99	5,337	.30	99.79	9,385	.42	99.81
3.00 " 3.49	21,555	1.20	99.49	20,653	.93	99.39
3.50 " 3.99	27,496	1.54	98.29	30,431	1.36	98.46
4.00 " 4.49	28,491	1.59	96.75	30,092	1.35	97.10
4.50 " 4.99	34,181	1.91	95.16	42,655	1.91	95.75
5.00 " 5.49	35,566	1.99	93.25	60,379	2.70	93.84
5.50 " 5.99	19,924	1.11	91.26	23,828	1.07	91.14
6.00 " 6.49	67,594	3.78	90.15	74,849	3.35	90.07
6.50 " 6.99	43,050	2.41	86.37	48,333	2.17	86.72
7.00 " 7.49	56,758	3.17	83.96	93,580	4.19	84.55
7.50 " 7.99	87,516	4.89	80.79	123,990	5.55	80.36
8.00 " 8.49	105,119	5.88	75.90	125,450	5.62	74.81
8.50 " 8.99	26,597	1.49	70.02	51,697	2.32	69.97
9.00 " 9.49	164,093	9.17	68.53	211,730	9.48	66.87
9.50 " 9.99	40,155	2.24	59.36	87,050	3.90	57.39
10.00 " 10.49	77,403	4.33	57.12	80,521	3.61	53.49
10.50 " 10.99	121,462	6.79	52.79	140,883	6.31	49.88
11.00 " 11.49	42,060	2.35	46.00	63,224	2.83	43.57
11.50 " 11.99	28,523	1.59	43.65	38,785	1.74	40.74
12.00 " 12.49	139,168	7.78	42.06	166,187	7.44	39.00
12.50 " 12.99	26,471	1.48	34.28	48,471	2.17	31.56
13.00 " 13.49	33,305	1.86	32.80	50,796	2.28	29.39
13.50 " 13.99	66,945	3.74	30.94	69,235	3.10	27.11
14.00 " 14.49	38,716	2.16	27.20	56 667	2.54	24.01
14.50 " 14.99	14,246	.80	25.04	24 537	1.10	21.47
15.00 " 15.49	99,658	5.57	24.24	104,985	4.70	20.37
15.50 " 15.99	12,523	.70	18.67	20,681	.93	15.67
16.00 " 16.49	29,046	1.62	17.97	32,991	1.48	14.74
16.50 " 16.99	30,390	1.70	16.35	42,125	1.89	13.26
17.00 " 17.49	16,213	.91	14.65	24,326	1.09	11.37
17.50 " 17.99	10,575	.59	13.74	14,093	.63	10.28
18.00 " 18.49	73,706	4.12	13.15	64,946	2.91	9.65
18.50 " 18.99	6,340	.35	9.03	7,341	.33	6.74
19.00 " 19.49	8,618	.48	8.68	9,144	.41	6.41
19.50 " 19.99	10,998	.61	8.20	10,563	.47	6.00
20.00 and over	135,502	7.59	7.59	123,601	5.53	5.53

Plotting a curve with the above data as before, we have the curve shown in Chart II. This chart, which probably shows with reasonable accuracy the results which may be deduced from the Dewey Report as to adult male wage-earners, seems to indicate that wages were, on the whole, lower in 1900 than in 1890. Instead of, as before, a rise in the lower wage groups, we have here apparently no change



until about the 7.50 group, at which point the 1900 line falls below, and the distance between the two curves grows as we proceed into the higher groups. At the end of the curves the 1890 data show that 7.59 per cent. of the adult male wage-earners in manufactures were earning $20 or more per week, while only 5.33 per cent. were in that class in 1900. Moreover, as indicated in Table IV, the material for the Dewey Report was so selected that undue weight was given the one section of the country showing a material increase in wages in manufactures between the years 1890 and 1900. Thus the error in the collection of the data is opposed to the results obtained. What the correct results would have given we can only surmise, but certainly they would not have made a showing more favorable to the social well-being of the worker in 1900 than is made in Chart II.

However, it is still possible to make a further test of this result. It has already been pointed out that the method of restricting data secured for comparison to establishments returned in both years was unwise as tending to lessen the representative quality of the work. We have also intimated that Professor Dewey's returns are so broadly representative as probably not to be affected by the error in method. Fortunately, the men who did the work in the field when they found it convenient returned the 1900 pay-rolls of many establishments whose pay-rolls for 1890 could not be obtained. These results were tabulated separately for the industries in which they were secured, and added to the establishments for which comparative returns were given, the aggregate figures being presented in a supplement to the regular report under the caption "1900 Total." When to this is added the returns for 1900 of those industries from which extra returns were not obtained, the result gives us not merely a larger base, but it also furnishes an interesting test of the representativeness of the total already given. Table VII contains this result arranged in wage groups with their accompanying absolute and cumulative percentages, and the

cumulative percentages for 1900 given in Table V are repeated in comparison with those of the total data for 1900.

This table includes those wage-earners tabulated for 1900 in the Dewey Report under the caption "1900 Total," and all others not therein included reported for 1900.

This table is surely a remarkable proof of the probable

TABLE VII.

THE DISTRIBUTION OF MALE WAGE-EARNERS SIXTEEN YEARS AND OVER, 1900.

Wage Groups.	Number.	Absolute per Cents.	Cumulative per Cents.	Cumulative Percentages of Table V.
Total	182,223	100.00	100.00	100.00
Under $2.00	36	.02	100.00	100.00
$2.00 to $2.49	138	.08	99.98	99.99
2.50 " 2.99	561	.31	99.90	99.92
3.00 " 3.49	1,403	.77	99.59	99.62
3.50 " 3.99	1,774	.97	98.82	98.91
4.00 " 4.49	2,127	1.17	97.85	97.96
4.50 " 4.99	2,997	1.64	96.68	96.87
5.00 " 5.49	2,981	1.64	95.04	95.25
5.50 " 5.99	1,606	.88	93.40	93.71
6.00 " 6.49	5,686	3.12	92.52	92.83
6.50 " 6.99	3,504	1.92	89.40	89.85
7.00 " 7.49	7,585	4.16	87.48	87.88
7.50 " 7.99	10,475	5.75	83.32	83.97
8.00 " 8.49	10,036	5.51	77.57	78.07
8.50 " 8.99	4,713	2.59	72.06	72.48
9.00 " 9.49	18,342	10.07	69.47	69.83
9.50 " 9.99	8,205	4.50	59.40	59.68
10.00 " 10.49	6,110	3.35	54.90	55.03
10.50 " 10.99	13,980	7.67	51.55	51.74
11.00 " 11.49	5,058	2.78	43.88	43.77
11.50 " 11.99	3,368	1.85	41.10	40.96
12.00 " 12.49	12,597	6.92	39.25	39.16
12.50 " 12.99	4,716	2.59	32.33	32.24
13.00 " 13.49	4,897	2.69	29.74	29.51
13.50 " 13.99	6,792	3.73	27.05	27.00
14.00 " 14.49	4,670	2.56	23.32	23.31
14.50 " 14.99	2,276	1.25	20.76	20.79
15.00 " 15.49	8,617	4.73	19.51	19.54
15.50 " 15.99	1,808	.99	14.78	14.84
16.00 " 16.49	2,451	1.35	13.79	13.80
16.50 " 16.99	3,725	2.05	12.44	12.48
17.00 " 17.49	1,634	.90	10.39	10.40
17.50 " 17.99	1,304	.72	9.49	9.51
18.00 " 18.49	4,395	2.41	8.77	8.78
18.50 " 18.99	662	.36	6.36	6.38
19.00 " 19.49	724	.40	6.00	6.00
19.50 " 19.99	1,153	.63	5.60	5.59
20.00 and over	9,117	4.97	4.97	4.99

accuracy of the Dewey Report. The addition of the wage data of nearly 22,000 wage-earners, or about 12.5 per cent. of the whole reported for the comparison in 1900, makes practically no difference in the result obtained. It therefore seems clear that the elaborate comparison of 1890 and 1900 was unnecessary, and that the results would have been the same, had each industry been carefully returned in each year without regard to the establishments from which these returns were secured. In other words, the accuracy of the return for each year and industry is the great end to be kept constantly in view, and to this all methods must be subordinate.

III.

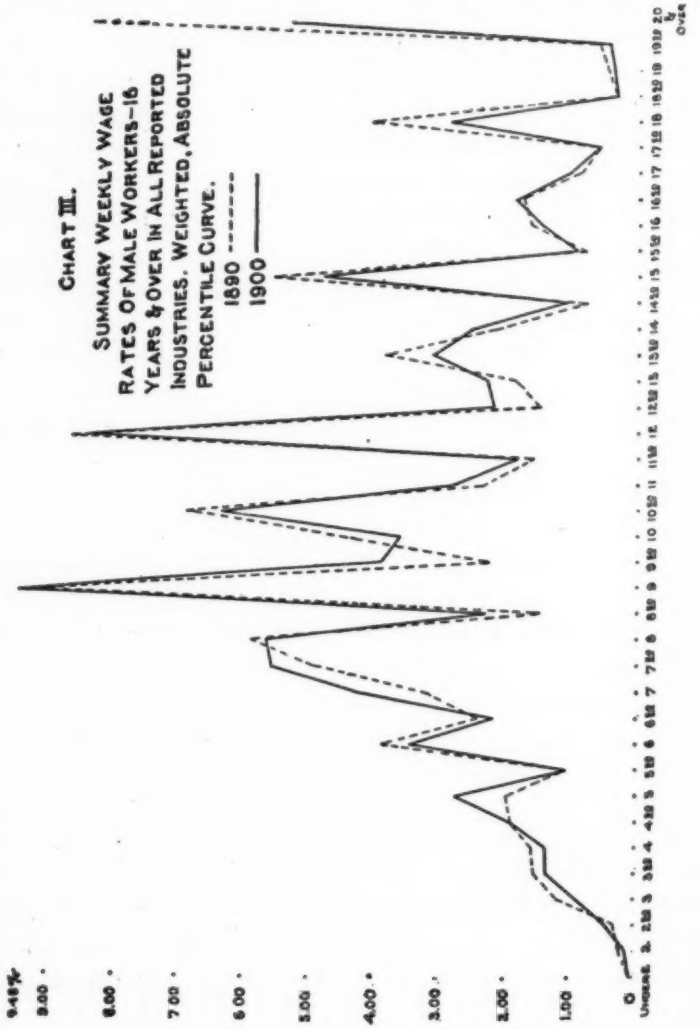
The averages generally used for the presentation of wage statistics are the arithmetic average, the mode, and the median quartiles and deciles. In addition to these there is generally necessary some measure of dispersion, since the distribution of the wages at the various rates is quite as important as any average possibly can be. A simple measure of this kind is the formula, $\frac{Q^2 - Q^1}{Q^2 + Q^1}$, where Q^1 and Q^2 are the first and last quartiles. As a measure of distribution, the cumulative percentile curve used in this paper has several valuable features. It not only gives the entire data in the original form, and thus permits us to locate changes at any and every point, but it possesses the advantage of all graphic representations, that its significance is easily grasped at a glance. For this reason no further study has been made of distribution or of the medians and other percentile averages.

Next to be considered are the arithmetic average and the mode as applied to the Dewey Report. The arithmetic average in wage statistics is at present somewhat discredited by careful statisticians. Certainly, the average possesses few attributes of value for the student who views wages from the social side. The wages of two

men, one of whom receives 20 and another 30 cents an hour, mean an altogether different thing from the wages of two men one receiving 5 cents and the other 45; yet the averages are identical. On the other hand, we know that the arithmetic average, the median, and the mode in an absolutely natural distribution meet at the same point; and to get the arithmetic average in connection with our other averages, and not as a substitute for them, makes possible an interesting comparison of our data with the ideal frequency curve. For this reason I have endeavored to get approximate arithmetic averages for the two years under consideration. I have multiplied the centre amount ($2.25, $2.75, $3.25) in each wage group by the number in that group, added the amounts so obtained for each year, and divided by the total number of employees, thus getting an average weekly rate of wage. The group under $2 I placed at $1.75, and that over $20 at $24. The averages so obtained for the weighted data were for 1890 $11.41 and for 1900 $11.32. This average is, I feel certain, a maximum, and the minimum I would locate not far from $11.16 and $11.07 for 1890 and 1900, respectively. These minima are the results which would be obtained by computing the average from the lower limit of each wage group instead of from the middle point. This average is, it will be noted, for each year higher than the median, and it is also higher than the mode. The reason for this is the tremendous weight which is given in the computation of an arithmetic average to the wages of the better paid workmen.

The mode as applied to wage statistics may be defined as "the style in wages." It is that wage received by a greater number of employees than is any other. It is of particular importance in wage data, as indicating the *typical* man. Thus the percentile points and the arithmetic average neglect absolutely the question of concentration or density, and may fall where there are practically no wage-earners whatsoever. A glance over a Report of the Bulletin of Labor

is as good as a trip to a department store bargain counter. Such wages as $1.47 per day, etc., are quite the rule. Yet who ever heard of a workingman knocking down his day's labor at $1.98 or $1.49? The mode as applied to the Dewey Report has been a most interesting study. Absolute per cents. are given in Table VI above, and these are plotted in the ordinary frequency curve for both years in Chart III.



The absolute irregularity of the figure is such that no results can be safely deduced therefrom as indicating the mode. There seem to be at least four prominent modes and many lesser ones. The $9 group stands out most prominently, but without further investigation we can hardly locate the mode at that point. Another test must therefore be applied. Thus far we have dealt with our data wholly in 50-cent groups. But it is possible by simple addition to get it into $1, $1.50, $2, or other groups which are multiples of 50 cents. Our object in so doing is to secure regularity in our data, and this is finally obtained in the $3 grouping. The numbers of wage-earners from Table VI thus combined for both 1890 and 1900 into $3 groups are given in Table VIII; and, since there

TABLE VIII.

DISTRIBUTION OF MALE WAGE-EARNERS SIXTEEN YEARS AND OVER IN $3 WAGE GROUPS.

Rates a Week.	1890.	1900.	Rates a Week.	1890.	1900.
Under $2.00	503	975	Under $2.50	3,666	4,305
$2.00 to $4.99	120,223	136,546	$2.50 to $5.49	152,626	193,595
5.00 " 7.99	310,408	424,959	5.50 " 8.49	379,961	490,030
8.00 " 10.99	534,829	697,331	8.50 " 11.49	471,770	635,105
11.00 " 13.99	336,472	436,698	11.50 " 14.49	333,128	430,141
14.00 " 16.99	224,579	281,986	14.50 " 17.49	202,076	249,645
17.00 " 19.99	126,450	130,413	17.50 " 19.99	110,237	106,087
20.00 and over	135,502	123,601	20.00 and over	135,502	123,601
Under $3.00	9,003	13,690	Under $3.50	30,558	34,343
$3.00 to $5.99	167,213	208,038	$3.50 " $6.49	213,252	262,234
6.00 " 8.99	386,634	517 899	6.50 " 9.49	483,133	654,780
9.00 " 11.99	473,696	622,193	9.50 " 12.49	448,771	576,650
12.00 " 14.99	318,851	415,893	12.50 " 15.49	279,341	354,691
15.00 " 17.99	198,405	239,201	15.50 " 18.49	172,453	199,162
18.00 " 19.99	99,662	91,994	18.50 " 19.99	25,956	27,048
20.00 and over	135,502	123,601	20.00 and over	135,502	123,601
Under $4.00	58,054	64,774	Under $4.50	86,545	94,866
$4.00 to $6.99	228,806	280,136	$4.50 to $7.49	257,073	343,624
7.00 " 9.99	480,238	693,497	7.50 " 10.49	500,883	680,438
10.00 " 12.99	435,087	538,071	10.50 " 13.49	390,989	508,346
13.00 " 15.99	265,393	326,901	13.50 " 16.49	261,134	309,096
16.00 " 18.99	166,270	185,822	16.50 " 19.49	145,842	161,975
19.00 " 19.99	19,616	19,707	19.50 " 19.99	10,998	10,563
20.00 and over	135,502	123,601	20.00 and over	135,502	123,601

are six 50-cent groups in each $3 group, it is possible, by shifting the point at which we begin to collect our groups, to get six different groupings of our data.

It will be noted that the mode in each one of the different groupings covers slightly different 50-cent groups.

These are

6.50	9.49
7	9.99
7.50	10.49
8	10.99
8.50	11.49
9	11.99

and, on the whole, only one 50-cent group is common to all the $3 model groups. That is the $9 to $9.49 group. Therefore, the mode may fairly be said to be in that group, and the typical male American factory worker may perhaps be said to be shown by the Dewey Report to be the man who receives $1.50 a day. No change appears in the mode between the two years.

This study of the mode brings out a most interesting phenomenon in connection with the grouping of wage-earners. I have already spoken of the absolute irregularity of the curve in Chart IV. It remains to be noted that there is a remarkable regularity in this irregularity. The groups which stand out above the others as most prominent modes or points of concentration are the $5, $6, $8, $9, $10.50, $12, $13.50, $15, $16.50, and $18 groups. Of these only the $5 and $8 groups are not multiples of 3×50 cents. We are already familiar with the concentration in age statistics upon the years which are multiples of 5. It would seem that there is some similar concentration in wage statistics, if our returns are sufficiently numerous to prevent accidental groupings. Mr. Bowley, in his "Elements of Statistics," p. 147, says: "Average earnings for a year will not be reckoned exactly by shillings or even pence. If we had a sufficient number of instances, we should get regular sequences of earners at successive farthings, and the line representing them would

have no sharp angles, but be continually curved." If the statement were merely that, it would not be open to criticism; but it is applied to a diagram showing *rates per week*, which exhibits almost the same phenomena as those presented in Chart IV. Whether 160,000 workers is a number sufficiently large to give "regular sequences," if such things really were inherent in our data, we will leave to our reader to judge. But may it not be possible that there are actually certain points of concentration in wage statistics? And, if this be true, it only remains to explain this concentration, derive the rule which governs it, and learn if it be actually true and inherent or merely error, like the concentration in age statistics. The reason lies, it would seem, in the factory system of wage payment. Payment is made, for the most part, in multiples of ½ cents an hour, and there would seem to be concentration on 5 × ½ cents and the multiples thereof. In other words, in week rates this means concentration on 30 cents and its multiples, with emphasis on the 5 multiples of 30 cents or the multiples of $1.50. This explains the concentration on all but the $5 and $8 groups, and shows why at $10.50 there are nearly twice as many as at $10. The $5 and $8 groups, however, contain *two* multiples of 30 cents,—namely, $5.10 and $5.40, and $8.10 and $8.40; and all the groups which contain but one multiple of 30 cents are those groups in which there are but few wage-earners. In other words, the method of wage payment in use in American factories has entirely destroyed the regularity of the wage curve, and has created artificial modes at the various multiples of 5 × 30 cents, and there is a concentration on all the 30-cent multiples to a greater or less degree.

The grouping chosen by Professor Dewey was, unfortunately, such as to exaggerate this concentration. Of every three 50-cent groups, two contain two multiples of 30 cents, and one only one multiple. Thus in each of the groups which contained two multiples there tended to be twice the number of employees that there were in the group containing one

multiple of 30 cents only. At first thought, indeed, it would seem that the data should have been arranged in 30-cent instead of 50-cent groups, in order that the irregularity of the groups might be reduced; but, on the other hand, we must remember that the sole object of grouping the data is to render it more intelligible and convenient, and surely a 30-cent arrangement would be necessarily clumsy and confusing. Moreover, the 30-cent multiple group itself depends entirely upon the number of hours in the day's labor, and a change to nine hours from ten would give us the impossible 27-cent grouping as a logical result of our rule. On the whole, a grouping which fits evenly into the unit of our monetary system would seem to be the most convenient and desirable. Whether a 50-cent group is small enough is perhaps questionable; but, in view of the facts already presented, the value of a smaller one would perhaps be doubtful. A 10-cent group would be too small. A 25-cent basis would possess all the faults of the 50-cent one with no compensating features except that only one multiple of 30 cents could be contained in the group. Certainly, for purposes of social investigation the 50-cent group is small enough.

But another question arises in connection with this concentration on these points which is very embarrassing to the theoretical statistician. This is the matter of smoothing the curve. In Mr. Bowley's work, to which I have already referred is found, p. 154, the following discussion of a cumulative curve plotted from the data of the Aldrich Report, in which occur the same phenomena which we have found in those of the Dewey Report: "The irregularities shown by the thin line" (an unsmoothed line of absolute cumulative groups similar to those used in this paper) "do not arise from any law of wage grouping, but are due to the accidents of observation; if we regard these returns as samples out of a much larger unregistered group, we may suppose that a smoothed curve will indicate approximately the form which would be obtained if our returns were com-

plete." Proceeding upon the theory enunciated above, Mr. Bowley applied to his data certain methods of interpolation, the result of which is a beautifully smoothed curve. But we have already pointed out that these irregularities do arise from a law of wage grouping. They are not due to the accidents of observation, and therefore we may not suppose that returns from every establishment in the country would give us a smoothed curve. If this be the case, is it not true that for correct statistical purposes we may neither smooth the curve nor interpolate? The purpose of smoothing the curve should be to eliminate error, and not to disguise the truth. For this purpose we smooth periodic curves and the age curve. But the irregularities of the wage curve are truth. Wage rates do concentrate about certain definite points, and to assume an even distribution is to assume a thing which is unwarranted by the facts. Moreover, it is customary to estimate the median and other percentile points "accurately" by this graphic method. Thus in Chart II we may locate the median at $10.50 and $10.73, respectively, for 1900 and 1890. Yet we are morally certain that in both years nearly every man in that group received $10.50, and our median so found is worthless. For instance, there might have been a change within the group, say the concentration in 1890 was on $10.50, in 1900 $10.80, yet the group would remain the same, and the medians show a fall instead of a rise. For this reason the use of the smoothed curve or of interpolation in cases of this kind is extremely dangerous, and is likely to mislead. The concentration, while due to our monetary system, is true, and is there, and the statistician has no right to smooth it out of existence.

We have examined in detail some of the most important parts of the Dewey Report. Much has been left untouched. The report gives statistics of wage rates for women and for male and female children. It gives rates per hour and earnings in a week for all classes of labor investigated. Thus

our study has by no means exhausted the rich mine of information contained in this excellent report. Summaries of week rates similar to that contained in Table V were made for women and children, but, because of lack of space and the comparative unimportance of the results obtained, these summaries have been omitted from this paper. Indeed, in view of the present chaotic state of wage statistics in this country, results in any investigation are of less importance than the methods used and the statistical points made clear. While I believe that the Dewey Report shows clearly that adult male wage-earners in manufactures earned less in 1900 than in 1890, I think it is of vastly greater importance to remember that that report has brought to the fore the wage group and the percentile summary,—methods that are far superior to any others yet devised to indicate by statistics of wages the welfare of the laboring class.

THE UPPER EAST SIDE: A STUDY IN LIVING CONDITIONS AND MIGRATION.

By Mary Louise Mark.

The district where this investigation was made extends from 96th Street to 115th Street and from Madison Avenue to First Avenue. The basis for the investigation was not families, but houses. Certain houses were chosen as being representative of housing conditions in their particular blocks, and as being fairly typical of a class more widely distributed throughout the district. The selection of all houses was made either by Dr. Michael M. Davis, Jr., Secretary of the People's Institute, and by Dr. Gaylord S. White, of Union Settlement, or under their supervision. In the following list of the twenty-five houses visited, each class is divided according to quality into grades A and B:—

100th Street: Nos 219, 227, O. L., Model 2,* Grade B; Nos. 309, 313, N. L.†

101st Street: No. 227, O. L., Model 2, Grade B.

102d Street: No. 173, O. L., Model 3, Grade A.

104th Street: No. 226, O. L., Model 5, Grade B.

105th Street: No. 117, O. L., Model 1, Grade B; No. 239, N. L.

106th Street: Nos. 157, 161, O. L., Model 6, Grade A; Nos. 228, 230, O. L., Model 7, Grade B; No. 231, O. L., Model 2, Grade B.

107th Street: Nos. 106, 112, O. L., Model 2, Grade B.

109th Street: No. 208, N. L.

110th Street: No. 125, O. L., Model 1, Grade B; No. 83, O. L., Model 7, Grade A.

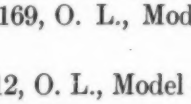
* For models see page 346.

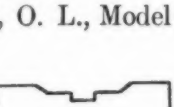
† "O. L." and "N. L." are abbreviations used throughout this paper for "Old Law" and "New Law."

Second Avenue (near 105th and 112th Streets): Nos. 2033, 2037, O. L., Model 5, Grade B; No. 2169, O. L., Model 1, Grade B.

Third Avenue (near 106th Street): No. 1912, O. L., Model 4, Grade A; No. 1916, O. L., Model 4, Grade B.

Park Avenue (near 101st Street): No. 1349, O. L., Model 2, Grade B.

Model I – 5 stories 

" II – 4 " 

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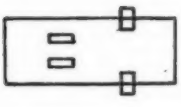
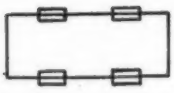
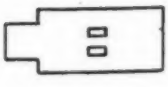
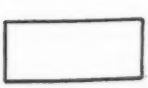
" IV – 5 " 

" V – 5 " 

" VI – 4 " 

" VII – 3 or 4 " 

The card used in the investigation was prepared by Dr. Davis with assistance from Miss Brandt, Dr. Bernheimer, and Miss Dinwiddie. In every case the card was filled out in the presence of the person giving the information. My usual procedure was to state that the investigation was being made in connection with school work, and to request the co-operation of the person who answered my knock. Very commonly the questioning on my part had not proceeded far before I was asked the purpose of the investigation. This question and all others I tried to answer as frankly as I wished my own answered; but the variations in intelligence made a great variety of explanations necessary, and I found it much harder to secure an interest in the work than to win sufficient confidence to make persons willing to give information. In three cases I met with antagonism which could not be overcome; in a larger number with some degree of good-natured contempt for so impractical a use of my time; in the case of foreigners newly arrived with an unquestioning submission to my inquiries as a matter of course; in perhaps half a dozen instances with a very intelligent sympathy.

The families investigated number 208. The total number of persons is 1,022. The children of the families may be classified as follows:—

TABLE I.

CHILDREN CLASSIFIED BY AGES.*

	Jews.		Non-Jews.		Total.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Under school age	112	40	80	30	192	35
At school age	100	37	117	43	215	39
Over school age	65	23	74	27	141	26
Totals	277	100	271	100	548	100

* The classification by Jews and non-Jews is made throughout this study because a different set of conditions was found to be correlated with each of these groups.

From these figures it is seen (1) that these families are generally young, only a little more than 25 per cent. of the total number of children being over fourteen, and (2) that the Jewish families, with 40 per cent. of their children under school age, and only 23 per cent. above fourteen, are younger than the non-Jewish who have 30 per cent. below school age and 27 per cent. above. This is explained by the fact that a large proportion of Jewish families have come to the district either at marriage or with young children. Certain nationalities of non-Jews would show the same thing.

The children are classified according to age and according to the nationality of the father in Table II.*

TABLE II.

NUMBER OF CHILDREN CLASSIFIED ACCORDING TO AGE AND ACCORDING TO NATIONALITY OF FATHER.

		Number Families.	Children under School Age.	Under 1 Year.	1 Year to 5 Years.	Children at School Age (6–14).	Children over School Age.	At Work.	At School	At Home.	Other.	Total No. Children.	Average No. Children per Family.
Jews.	Russia	56	62	13	49	61	37	29	3	5	–	160	2.86
	Austro-Hungary	20	28	8	20	18	7	5	1	1	–	53	2.65
	Roumania	3	2	–	2	–	–	–	–	–	–	2	
	Germany	16	13	1	12	7	19	15	–	3	1	39	2.44
	Holland	1	–	–	–	3	1	–	1	–	–	4	
	United States	7	7	–	7	11	1	1	–	–	–	19	2.71
	Totals	103	112	22	90	100	65	50	5	9	1	277	2.69
Non-Jews.	United States	37	25	2	23	44	30	27	2	1	–	99	2.68
	Ireland	23	16	4	12	21	20	18	1	1	–	57	2.47
	England	2	–	–	–	2	–	–	–	–	–	2	
	Canada	2	3	–	3	4	–	–	–	–	–	7	
	Scandinavia	2	5	1	4	4	2	1	–	1	–	11	
	Switzerland	1	–	–	–	–	2	1	–	1	–	2	
	Germany	19	11	3	8	23	14	11	1	2	–	48	2.53
	Italy	15	18	3	15	17	6	4	–	2	–	41	2.73
	Austro-Hungary	2	2	–	2	2	–	–	–	–	–	4	
	Totals	103	80	13	67	117	74	62	4	8	–	271	2.63
	Grand Totals,	206	192	35	157	217	139	112	9	17	1	548	2.66

* Two childless widows who came to the United States as such are omitted in this able.

The average number of children in the Jewish families is 2.69, in the non-Jewish 2.63, making an average for the whole group of 2.66. The average number of children per family is given by nationalities in the table wherever the nationality is represented by more than six families. Among the Jews the Russian family is largest, which is not surprising, since it is older than the Austro-Hungarian and American, and more regular than the German. Among non-Jews the Italian is the largest as well as the youngest family. The American family averages almost the same as the entire group does.

TABLE III.

AGES OF HEADS OF FAMILIES.

	Jews.		Non-Jews.		Totals.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Under 20 years	1	1	0	0	1	1
20 years to 25 years	10	10	4	5	14	7
25 " " 30 "	24	24	12	14	36	19
30 " " 35 "	26	26	12	14	38	20
35 " " 40 "	10	10	18	20	28	15
40 " " 45 "	11	11	21	23	32	17
45 " " 50 "	11	11	7	8	18	10
Over 50 years	7	7	14	16	21	11
Totals	100	100	88	100	188	100

Just 50 per cent. of all the Jewish heads of families are between the ages of 25 and 35 years. There are 11 per cent. younger than this group, and 39 per cent. older. Among non-Jews 44 per cent., the largest proportion for any ten years, are between the ages of 35 and 45, 32 per cent. are under 35 years of age, and 24 per cent. are above 45. Nearly 75 per cent. of the whole group are between 25 and 45 years old. The average age of Jewish heads of families is 34.6, of non-Jewish 39.9, and of the whole group 37.2 years.

In a lower East Side block * investigated by Dr. C. S. Bernheimer, of the University Settlement, the average age

* This block is bounded by Allen, Orchard, Stanton, and Rivington Streets.

of the heads of Jewish families is 36 years. A comparison of the two Jewish groups shows that the heads of families on the upper East Side are younger than those down town, 61 per cent. of the former and only 48 per cent. of the latter being under 35 years old.

The relative ages of families of the various nationalities classified as Jewish and non-Jewish appear in Table II. Both groups show a correlation between the age of families and the length of residence in the district. The Austro-Hungarian Jews and the Italians, who have the largest proportion of children under school age in their respective groups, are also the newest comers to the district. The Irish and German families are the remnant of the older population. Together they are only 20 per cent. of the whole number of families studied, but they furnish nearly 50 per cent. of the families containing none but adult children. That the length of residence in the district has a relation to the size and age of these families is evident from the fact that within the last six years the number of Jewish families coming to the district either at marriage or before the eldest child was six years old is about half of the total number of Jewish families studied.

Of the 208 apartments visited, 152 are O. L. and 56 are N. L. The number of rooms per apartment and number of dark rooms in each apartment are shown in Table IV:—

TABLE IV.

HOUSING CONDITIONS.

Number of Rooms per Apartment.	Number of Dark Rooms per Apartment.					Total	
	0		1	2	3	O. L.	N. L.
	O. L.	N. L.					
2	0	0	2	0	0	2	0
3	10	35	12	7	0	29	35
4	13	21	2	14	2	31	21
5	47	0	17	9	8	81	0
6	3	0	4	0	2	9	0
Total.	73	56	37	30	12	152	56

A room is classified as dark if it has no window, a window boarded up, or a window opening on a shaft which does not admit sufficient light to make reading possible in the middle of the day. According to this definition nearly half of the O. L. apartments have no dark rooms. The N. L. apartments, of course, are without dark rooms.

The number of rooms to each family is as follows:—

Number of families in two-room apartments	2
" " " " three-room "	64
" " " " four-room "	52
" " " " five-room "	81
" " " " six-room "	9
Total	208

The number of persons in each apartment is given in Table V:—

TABLE V.

NUMBER OF PERSONS PER APARTMENT.

Number of Rooms per Apartment.	Number of Persons per Apartment.										Total.
	1	2	3	4	5	6	7	8	9	10	
2	–	1	–	1	–	–	–	–	–	–	2
3	3	10	13	16	12	6	3	1	–	–	64
4	–	5	8	10	6	9	7	4	3	–	52
5	1	7	10	10	15	11	15	5	4	3	81
6	–	–	1	–	1	–	4	2	–	1	9
Total	4	23	32	37	34	26	29	12	7	4	208

An inspection of this table shows that 93 apartments have one person or less per room, that only 21 have two persons or more per room, and that in no case is the number of persons per room as high as three. The average number of persons to a room in the three-room apartments is 1.31; in the four-room is 1.28; in the five-room is 1.08; and in the six-room is 1.02. The average number of persons per room for the whole group is 1.18. The average number in the lower East Side block before referred to is 1.82.

In considering the subject of rent, the variation in the character of the houses must be taken into account. As a rule, the houses selected are of a better class toward the west and north of the district. On 106th Street, which is of unusual width and is convenient to the elevated station, are five of the twenty-five houses, and all are distinctly above the average. The apartments along the avenues are only fairly good, but the noise of the elevated railways, which would appear to be the most serious thing against them, seems to be objected to slightly, if at all, by the residents.

The four N. L. houses are all very similar, except that two have baths in addition to other improvements required by law. Five of the O. L. houses, or 32 of the 152 apartments, have baths, but some of the tenants claim that they are of little use in winter on account of the inadequate arrangements for heating the room. All the baths in O. L. houses are in five and six room apartments.* So far as observed, each house has at least one toilet to a floor and each apartment has running water in the kitchen.

There was every variation found in the condition of the halls. The best houses have velvet or Brussels carpet on floors and stairways. One has furnace-heated halls, and several have bells in working order. The poorest houses have rough, uncarpeted floors, sometimes poorly lighted and sometimes very dark. In a few cases I found the halls dirty, but usually they were in very good condition.†

Rents range from $6 to $24 per apartment.‡ Table VI shows the range of rents of apartments classified according to the number of rooms per apartment, and Table VII shows the range of rents per room classified in the same way:—

* In one of the six-room houses there are no bath-rooms, but each apartment has a tub in the bedroom next to the kitchen.

† In one house the occupants of the apartments are responsible for the care of the halls. The plan seems to work very well.

‡ The one $24 apartment is a five-room apartment on the second floor. The front room is used as an office. With this exception, $22 is the maximum rent.

TABLE VI.

RENTS PER APARTMENT.

Rent of Apartment per Month.	Number Rooms per Apartment.							Total O. L.	Total N. L.	Grand Total.
	2 O.L.	3 O.L.	3 N.L.	4 O.L.	4 N.L.	5 O.L.	6 O.L.			
$6 to $7.50	1	1	–	–	–	–	–	2	–	2
8 " 9.50	–	9	–	–	–	–	–	9	–	9
10 " 11.50	1	10	9	9	–	–	–	20	9	29
12 " 13.50	–	4	14	22	–	2	–	28	14	42
14 " 15.50	–	5	12	–	6	26	–	31	18	49
16 " 17.50	–	–	–	–	8	23	2	25	8	33
18 " 19.50	–	–	–	–	7	10	1	11	7	18
20 " 21.50	–	–	–	–	–	15	5	20	–	20
22 " 23.50	–	–	–	–	–	4	1	5	–	5
24	–	–	–	–	–	1	–	1	–	1
Totals	2	29	35	31	21	81	9	152	56	208

TABLE VII.

RENTS PER ROOM.

Rent per Room per Month.	Number Rooms per Apartment.							Total O. L.	Total N. L.	Grand Total.
	2 O.L.	3 O.L.	3 N.L.	4 O.L.	4 N.L.	5 O.L.	6 O.L.			
$2.00 to $2.49	–	1	–	–	–	–	–	1	–	1
2.50 " 2.99	–	4	–	9	–	8	2	23	–	23
3.00 " 3.49	1	6	1	22	–	40	5	74	1	75
3.50 " 3.99	–	9	8	–	6	13	2	24	14	38
4.00 " 4.49	–	3	12	–	8	19	–	22	20	42
4.50 " 4.99	–	4	12	–	7	1	–	5	19	24
5.00 " 5.49	–	2	2	–	–	–	–	2	2	4
5.50	1	–	–	–	–	–	–	1	–	1
Totals	2	29	35	31	21	81	9	152	56	208

Nearly 24 per cent. of all the apartments are between $14 and $16, and nearly 60 per cent. are included between $12 and $18. The N. L. apartments rent much higher than the O. L. of the same number of rooms. Among the three-room apartments, nearly 70 per cent. of the O. L. rent for

less than $12, and nearly 75 per cent. of the N. L. rent for $12 or more. The point of division among the four-room apartments is $14, all the O. L. renting for less than that amount, and all the N. L. renting for that or more. The most common rent per room is from $3 to $3.50. One-half of all the O. L. apartments fall here. But all except one of the N. L. and more than half of the total number of apartments rent for more than this amount. 75 per cent. of the N. L. apartments rent at from $4 to $5 per room.

TABLE VIII.

AVERAGE RENT PER APARTMENT AND PER ROOM.

Number of Rooms per Apartment.	Average Rent per Apartment.			Average Rent per Room.		
	O. L.	N. L.	Average.	O. L.	N. L.	Average.
6	$19.44	—	$19.44	$3.24	—	$3.24
5	17.20	—	17.20	3.44	—	3.44
4	12.16	16.57	13.94	3.04	4.14	3.48
3	10.88	12.76	11.91	3.63	4.25	3.97
2	8.50	—	8.50	4.25	—	4.25
Average .	$14.98	$14.19*	$14.77	$3.39	$4.21	$3.61

* Note the absence of five and six room apartments in this average.

The table of average rents per apartment and per room shows an increase in rent per room as the number of rooms to the apartment decreases. The four-room O. L. houses are an exception. This is probably explained by the fact that those houses which have four apartments on each floor are, as a class, distinctly inferior to the five and six room houses.

The average rents of the 339 O. L. apartments in the Allen Street block investigated by Dr. Bernheimer are as follows:—

Two-room apartments, $10.66 per month.
Three-room apartments, $14.08 per month.
Four-room apartments, $18.63 per month.
Five-room apartments, $20.56 per month.

Over 96 per cent. of these lower East Side apartments belong to the three-room and four-room classes. Comparing the average rents of these two classes with the average rents of the three-room and four-room O. L. apartments up town, we find that the average rent of the three-room apartments is $3.20 higher, and of the four-room apartments is $6.47 higher in the lower than in the upper East Side group. The three-room and four-room O. L. apartments down town bring an average rent respectively $1.67 and $2.06 higher than the three-room and four-room N. L. apartments up town. The average rent per room in the lower East Side block is $4.67, which is $1.28 more than among the O. L. apartments on the upper East Side.

The comparative rents of three-room and four-room apartments in three different districts of Manhattan are given in Table IX. The figures for Corlears and Greenwich * were secured by Mr. Robert Patterson.

TABLE IX.

RENTS ON THE UPPER AND LOWER EAST SIDE.

Three-room Apartments.

Rent per Month.	Upper East Side.		Lower East Side.					
			Allen Street Block.		Corlears.		Greenwich.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
$6.00 to $7.50	1	2	–	–	–	–	–	–
8.00 " 9.50	9	14	–	–	–	–	1	1
10.00 " 11.50	19	30	3	1	–	–	25	13
12.00 " 13.50	18	28	110	36	17	10	92	48
14.00 " 15.50	17	26	149	50	68	41	46	24
16.00 " 17.50	–	–	37	12	62	38	18	9
18.00 " 19.50	–	–	1	½	18	11	9	5
20.00	–	–	1	½	–	–	–	–
Totals	64	100	301	100	165	100	191	100

* The Corlears District extends from Fourteenth Street south. The apartments are scattered throughout this and the Greenwich districts.

TABLE IX.—*Continued.*

Four-room Apartments.

Rent per Month.	Upper East Side.		Lower East Side.					
			Allen Street Block.		Corlears.		Greenwich.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
$10.00 to $11.50	9	17	–	–	–	–	–	–
12.00 " 13.50	22	42	–	–	4	2	6	3
14.00 " 15.50	6	12	–	–	22	9	26	12
16.00 " 17.50	8	15	7	27	29	12	63	28
18.00 " 19.50	7	14	13	50	56	23	52	24
20.00 " 21.50	–	–	5	19	33	13	22	10
22.00 " 23.50	–	–	1	4	29	12	30	14
24.00 " 25.50	–	–	–	–	49	20	16	7
26.00 " 27.50	–	–	–	–	18	7	2	1
28.00 " 29.50	–	–	–	–	2	1	2	1
30.00 " 31.50	–	–	–	–	4	2	1	–
Totals	52	100	26	100	246	100	220	100

The relatively lower rents in the newer district are seen at a glance. Rents which range from low to medium in other districts would be from medium to high on the upper East Side. A tenant who is paying the usual rent in one of those down-town districts can come up town and have a choice of apartments at the same price, or he can secure an apartment of the same grade as before at a much lower rent.

The rise in rents of which the tenants complain is shown by comparing the rents of the upper East Side apartments with the rents of the same apartments in 1902. The number of apartments not catalogued with the rent cards of the Tenement House Department is three; the number remodeled is 18; one card is marked "J," indicating janitor service in lieu of rent. This leaves 130 of the 152 O. L. apartments whose rents in 1902 and 1906 are comparable.

The average rent of these 130 apartments in 1902 was $12.30 and in 1906 was $14.93, making an average increase

of $2.63 per apartment, an increase of 21 per cent. The average rent of rooms in 1902 was $2.76, and in 1906 it had risen to $3.35, an average increase of 59 cents per room, or 21 per cent. Tables XIII and XIV show the range of increase per apartment and per room of the apartments classified according to the number of rooms in each.

TABLE X.

INCREASE IN RENT PER APARTMENT,—1906 OVER 1902.

Increase per Apartment.	Number Rooms per Apartment.				Totals.
	3	4	5	6	
None	1	2	–	–	3
$1 to $2	10	6	12	2	30
2 " 3	7	17	13	1	38
3 " 4	1	5	17	2	25
4 " 5	2	1	23	1	27
5 " 6	1	–	4	–	5
6 " 7	–	–	1	–	1
7.50	1	–	–	–	1
Average Increase	$2.26	$2.10	$3.01	$2.33	$2.63

TABLE XI.

INCREASE OF RENT PER ROOM,—1906 OVER 1902.

Increase per Room.	Number Rooms per Apartment.				Totals.
	3	4	5	6	
None	1	2	–	–	3
Less than $0.25	–	–	12	2	14
$0.25 to $0.50	3	6	12	1	22
.50 " .75	13	17	18	3	51
.75 " 1.00	1	5	23	–	29
1.00 " 1.50	2	1	5	–	8
1.50 " 2.00	2	–	–	–	2
2.00 " 2.50	–	–	–	–	–
2.50	1	–	–	–	1

The most common increase per apartment has been between $2 and $3, and 52 per cent. of all the increase has been

between $1 and $3. Nearly 40 per cent. of the increases per room have been between 50 cents and 75 cents. The greatest increase per apartment has been in the five-room apartments, and the greatest increase per room has been in the case of the three-room apartments. The table shows that only three of the 130 apartments have not risen in rent.*

In a small number of cases the rise in rents is doubtless due in part to slight improvements of a permanent character. The only alteration I observed which makes the apartment more desirable is the cutting of large windows in the walls between bedrooms and outside rooms. The great amount of moving from house to house gives the landlord the opportunity to raise the rent of his apartment. Where two equally desirable apartments on the same floor differ in rent, the tenant who pays a dollar more is almost sure to be a new-comer. But the tenants in one or two houses said that the landlord regularly raises the rent of every apartment in the house $1 a year.

Only an estimate can be made of the proportion of income which is spent for rent. Much more careful studies of the subject have been made than was possible in this investigation. The subject of income was introduced wherever the circumstances seemed favorable, and, after the relation of the question to the subject of rents had been explained, the wages of each working member of the family was asked. Where employment was irregular, an estimate of the amount of idle time or of the average income was obtained. In about one hundred cases sufficient information on which to base a calculation was secured.

According to this calculation the rent of 45 per cent. of these families is from 20 per cent. to 30 per cent. of their income; of 35 per cent. it is from 10 per cent. to 20 per cent. of their income; and of the remaining 20 per cent. it is more than 30 per cent. of their income.

* Two of the three are tenants of more than five years' residence in the houses.

The religion of families is given below. The classification by O. L. and N. L. houses shows that 44 per cent. of all the Jewish families live in N. L. houses, and that 80 per cent. of all the N. L. dwellers are Jews.

TABLE XII.

RELIGIONS.*

	O. L.	N. L.	Totals.	Per cent.
Jews, Orthodox	36	43	79	38
Jews, Reformed	20	2	22	11
Jews, total	56	45	101	49
Catholic	72	8	80	38
Protestant	19	2	21	10

* Six cases are not included in the table on account of irregularity.

The nativity of the husband and wife in each family is shown in Table XIII. In each block the nativity of the

TABLE XIII.

NATIVITY.

		Women born in											
		United States.		Canada, England, Scotland, Ireland.		Switzerland, Germany, Scandinavia, Holland.		Italy.		Austro-Hungary, Russia, Roumania.		Total, Men.	
Men born in		Total.	Jews.	Total.	Jews.	Total.	Jews.	Total.	Jews.	Total.	Jews.	Total.	Jews.
ed States	Total	27	–	9	–	3	–	–	–	2	–	41	–
	Jews	–	3	–	0	–	2	–	–	–	2	–	7
da, England, Scotland, land	Total	3	–	23	–	–	–	–	–	–	–	26	–
	Jews	–	0	–	0	–	–	–	–	–	–	–	0
erland, Germany, andinavia, Holland	Total	6	–	1	–	30	–	–	–	–	–	37	–
	Jews	–	2	–	0	–	14	–	–	–	–	–	16
	Total	–	–	–	–	–	–	14	–	1	–	15	–
	Jews	–	–	–	–	–	–	–	0	–	0	–	0
ro-Hungary, Russia, umania	Total	2	–	–	–	3	–	–	–	76	–	81	–
	Jews	–	2	–	–	–	3	–	–	–	74	–	79
tal, Women	Total	38	–	33	–	36	–	14	–	79	–	200	–
	Jews	–	7	–	0	–	19	–	0	–	76	–	102

husband is found at the left of the page, and that of the wife at the top of the page. The facts are given only for groups of nationalities, and the cases of widowers, single men, and widows who lost their husbands before coming to the United States, are omitted.

Inquiries in regard to citizenship revealed the following facts: Thirty-four of the 162 foreign-born men have been in the United States less than five years. The 128 foreign-born who are eligible to citizenship are distributed as follows: Jews, 68; Irish, 20; Italians, 12; and others, 28. Twenty-six Jews, or 38 per cent. of the whole number of the eligible, are not citizens; two of the Irish, or 10 per cent.; eight of the Italians, or 67 per cent.; and six of all other nationalities, or 21 per cent., are not citizens. The per cent. of Italians is noticeably high. But it must be taken into account that four of the eight eligible Italian non-citizens have been in the United States only five and six years, and seven of the 26 eligible Jewish non-citizens have been here for the same length of time.

Occupations have been classified under seven heads: (1) Professions; (2) Responsible Places in Trade, Low Grade;* (3) Clerical Work;† (4) Skilled Personal Service; (5) Skilled Manual or Mechanical Labor; and (6) Unskilled Labor. In cases where there is no income from the head of the family the occupation of the chief wage-earner has determined the classification.

The numbers of persons in each of these groups is as follows:—

Professions	6
Responsible places in trade	22
Clerical work	22
Skilled personal service	18
Skilled manual or mechanical labor	101
Unskilled labor	39
Total	208

* Owners of small businesses. No high-grade places were found in the group. Small owners of apartment houses who derive their chief income in this way are classified here.

† Used broadly to include some occupations where writing is not the chief part of the work.

The very small group of professional people is composed entirely of foreign-born persons, and is predominantly Jewish. Four of the six in this group have been in the United States less than five years.

Of the 22 persons who hold responsible places in trade only two are American-born. This group is made up of small shopkeepers and owners of apartment houses who derive their chief income from this source. All but six of the 22 are Jews.

Among the 22 persons in clerical work only eight are Jews. Thirteen of this group are American-born. The large proportion is partly explained by the fact that nine are not the natural heads of the families, but are adult children who furnish the main part of the income on account of the death, disability, or absence of their fathers.

Just half of the group in skilled personal service are Jews. Of the 18 persons in this kind of work eight are American-born, and seven others have been in America more than ten years.

The number of persons in skilled manual or mechanical labor is almost half of the whole number studied. Forty-seven of this group are employed in factories, principally as tailors and cigar-makers. Thirty-six of the 54 not working in factories are employed in the building trades. More than half of this group are Jews. There are all variations in length of residence among the people in this kind of work, but a large number are new-comers.

The majority of the persons employed in unskilled labor are either drivers and teamsters or small pedlers. Twelve of the 39 are Jews. The non-Jewish are almost all native American or German and Irish of the immigration of twenty and thirty years ago.

As a rule, the responsible places in trade, the clerical work, and the skilled personal service are in the hands of persons who have been in the United States for many years or who are native-born. The groups most largely made up of new-

comers are the professional and the skilled labor. A good many persons have had their trades on coming to the United States and have not changed employment, others have learned trades during the first year or two in this country, and still others have worked into their present trades from other trades or from unskilled labor of some kind. The occupations of the children of working age show that there is a tendency to avoid personal service and to go into clerical work. Only two of the 112 are in the former class, and nearly one-third are in the latter. On the whole, it seems clear that there is some degree of causal connection between length of residence in the country and the nature of the occupation.

Table XX gives the length of residence of these families (1) in the United States, (2) in the apartment, and (3) in the district. It also shows the sources of the migration into the district for each period of time. The columns of totals include the Jews, who are given again separately in the following columns:—

TABLE XIV.

	Length of Residence										Number of Families in the District coming from											
	In the United States.		In Apartment.						In the District.		Lower East Side.		Upper East Side.		Elsewhere in New York City.		Elsewhere in the United States.		Europe direct.		Unknown.	
			O. L.		N. L.		Total.															
	Total.	Jews.	Total.	Jews.	Total.	Jews.	Total.	Jews.	Total.	Jews.	Total.	Jews.	Total.	Jews.	Total.	Jews.	Total.	Jews.	Total.	Jews.	Total.	Jews.
Less than ½ year . . .	3	3	36	14	26	23	62	37	23	18	16	13	–	–	4	2	1	1	2	2	2	1
½ year to 1 year . . .	2	2	15	3	28	21	43	24	25	19	16	13	3	2	2	1	1	1	1	1	–	–
1 " " 2 years . . .	3	3	27	10	2	2	29	12	19	12	12	8	3	2	1	1	2	–	1	1	–	–
2 " " 5 " . . .	26	20	47	22	–	–	47	22	50	27	26	18	10	3	6	3	3	–	4	3	1	–
5 " " 10 " . . .	23	15	21	8	–	–	21	8	39	19	15	8	6	2	5	2	3	3	2	–	8	4
10 " " 20 " . . .	53	38	4	–	–	–	4	–	39	8	20	5	4	1	8	–	–	–	1	–	5	2
20 " " 30 " . . .	36	11	2	–	–	–	2	–	12	–	7	–	3	–	–	–	1	–	–	–	2	–
Over 30 years	18	4	–	–	–	–	–	–	1	–	–	–	1	–	–	–	–	–	–	–	–	–
Total	164	96	152	57	56	46	208	103	208	103	112	65	30	10	26	9	11	5	11	7	18	7

Table XIV shows that 57 of the 164 foreign-born, or 35 per cent., have been in the United States less than ten years, and that 43 of the 57, or 75 per cent. of these late comers, are Jews. Among the Jews the recent immigrants are Russian and Austro-Hungarian. More than 50 per cent. have been in the United States less than ten years, while only 12½ per cent. of the German Jews have come to this country within that time.

The length of residence in the apartment is given for O. L. and N. L. houses separately in Table XIV. The N. L. population is largely Jewish and is comparatively new to the district, 32 of the 56 N. L. tenants having been up town less than a year and 50 less than five years.

An inspection of the length of residence in the district shows (1) that, as a whole, these families are a population new to the district; and (2) that equal numbers have not come into the district at equal periods of time, but that the volume of immigration into this quarter has been increasingly Jewish.*

The migration is subdivided according to its sources in the rest of the table. Where families have lived in the district ever since marriage, they are classified according to the previous residence of the head of the family. In 18 cases this item was not obtained. In 30 cases the husband lived on the upper East Side before marriage. But he was not always of the old population. In a number of instances he had been in the district or in the country only a short time. The principal source of migration is the lower East Side. Table XV gives the percentages of migration from this and the other sources.

* The investigation did not extend into the new Italian quarter east of Second Avenue.

TABLE XV.

PERCENTAGES OF MIGRATION FROM THE SOURCES.

Sources.	Non-Jews.		Jews.		Total.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
From lower East Side . .	47	50	65	67.7	112	58.9
" upper " " . .	20	21.3	10	10.4	30	15.8
" elsewhere in N. Y. C.	17	18.1	9	9.4	26	13.7
" " " U.S. . .	6	6.4	5	5.2	11	5.8
" Europe direct . . .	4	4.2	7	7.3	11	5.8
Total known	94	100.	96	100.	190	100.
Unknown.	11	-	7	-	18	-

The causes of migration to this district are:—

(1) The comparatively low rents of the district.
(2) The better quality of the home.
(3) Social reasons.
(4) The tendency to be near work.
(5) Migratory habits.

The fourth of these causes has little connection with the others. The tendency to be near work is in itself sufficient to account for the residence here of the considerable number who assign this reason, just as it accounts for the residence of other families in other quarters where work is to be had.

The first two causes, lower rents and better homes, operate together. Not only the smaller expenditure for rent, but also the larger rooms and superior conveniences, are an attraction to persons in the crowded quarters. The desire for this twofold advantage has been the chief motive in the largest number of cases.

The third cause, the social, is probably next in importance. The number of recently married couples who leave their relatives and move to this district suggests the possibility

that their reasons for this step are not solely economic, but that they think their social standing will be better if they begin life as a separate family in the northern section of the East Side. This motive of social advancement is from its nature difficult to detect, for it underlies other motives which are more easily put into words. Evidence that it exists appeared in a few cases where persons were embarrassed or apologetic in discussing their residence in the lower part of the city. It may have been the motive concealed under some answers so vague that they meant nothing.

Very frequently persons said that they had moved to the district to be near friends or relatives. In some cases either the husband or the wife has lived here before marriage. In others the change of residence of the family seems to be part of the migration of a larger circle of relatives who like to live near one another.

Most of the remaining reasons assigned for the change of location may be classified as due to migratory habits. There is a feeling of restlessness not always so frankly expressed as by the woman who said she moved because she wanted a change. It seems pretty evident that some of the movement into the district is an unreasoning following of the crowd, the result of a desire to do what other people are doing. "When people get married, they 'most generally move up town," was the only explanation one woman could give for her course of action. Some people who seemed unable to give any reason at all for having moved, and a few others who gave the conventional answer of high rents, were probably actuated principally by a love of change.

In summary, the economic motive is undoubtedly that most generally present and most effective. The migration is really a search for adequate shelter caused by the comparatively higher and constantly rising rents in the older parts of the city. A second motive, which not infrequently strengthens the first, is the desire for the companionship of persons of the same kindred and nationality, and the dislike

of persons more widely removed in blood. These motives are strengthened by restlessness and by a sheep-like tendency to follow unreasoningly in the steps of others.

The families studied in this district indicate a population comparatively young which is here not so much because it has been crowded out of the older districts as because it is an enterprising people in search of better conditions. Besides the economic betterment which it has consciously sought and is seeking, it has found little in the district. Largely because the population is so new, there is an absence of tradition and little organized public opinion. The great need of the neighborhood is education and development of social and civic interests among the people.

The families are of an age when the tendency is for parents and children to seek recreation and broader associations outside the home. At present the penny arcades and cheap theatres, the saloons, and a number of respectable dance halls are their common resources, and these things do not exert a particularly wholesome or uplifting influence. The Union Settlement and a new Jewish settlement represent the greater part of this kind of effort in the neighborhood. The church is weak. The public schools have until recently been much overcrowded. The city's effort in behalf of the district along these lines is represented by a branch of the Public Library and by two recreation centres in connection with the public schools. It is evident that the needs of the neighborhood at the present time are not adequately supplied by these agencies.

As has been suggested, the ambitions of the people seem to be along material lines. There is little community feeling and little desire for social and civic betterment, but the struggle is for individual advancement. As the community grows older, the tendency will be for the more prosperous to become more and more self-centred, and for the conditions surrounding the less fortunate to approximate the present bad conditions in the older and more crowded parts of the

city. The problem to-day is twofold: (1) to educate the more progressive and promising elements of the population, particularly the young people, with a view to creating a strong sense of responsibility for the welfare of the community as a whole; and (2) by philanthropic and civic effort, preferably of organizations within the community, to forestall those conditions which have made the lower parts of the city so undesirable as places of residence.

SOME FACTS ABOUT THE PRISON POPULATION IN THE UNITED STATES.*

By John Koren.

It is humiliating to admit the absolute dearth in the United States of competent statistics of crime. The hard truth is that no one can state on the basis of well-ascertained facts the approximate volume of crime in this country, and whether it shows a rising or falling tendency. We indulge in much guess-work, and the chief guessers seem particularly fascinated by speculation concerning the cost of crime. The great social burden each one of us must help bear on account of crime is patent enough. We may even be inclined to subscribe to extravagant estimates of the annual budget to be met in order to prevent, detect, and punish crime. But, in the expressive vernacular, we have not cared sufficiently to find out where we are at. In other civilized lands they have. For our country at large the decennial federal enumerations of prisoners have been and continue to be the chief source of information. But even an ideal census of prisoners is utterly disappointing when applied in measurement of the volume of crime, its increase or decrease. By counting the prison population on a given date or the number committed to penal institutions during a stated period, we merely disclose a part of the large output of the criminal courts. The numbers of unconvicted offenders, and the numbers who, although found guilty, escape incarceration by means of the payment of fines or through some form of judicial leniency, remain unknown. The most important

* Address delivered at the annual meeting of the National Prison Association of the United States, Chicago, Sept 18, 1907.

source of information concerning the crime problem has been neglected.

Until we can put alongside of our prison statistics reliable reports on the disposition of criminal cases drawn from the dockets of all courts with criminal jurisdiction, the verdict rendered so often by foreign investigators must stand,—the United States is without adequate criminal statistics.

Yet I should certainly be the last to decry the great usefulness of statistics of prisoners. They are our chief source of knowledge concerning the elements of population that enter into the criminal classes, the social conditions of these elements, the proportion of prisoners convicted for the different kinds of offences, the penalties meted out, etc. In short, properly presented facts in regard to the prison population form an indispensable contribution to our knowledge of various phases of the crime problem.

At the census of June, 1890, the sane prisoners at least five years of age in the United States, exclusive of those in military prisons, numbered 1,067 in each million of population in the United States; but fourteen years later, in June, 1904, they numbered 1,006 in each million. The figures, therefore, indicate an actual decrease since the last enumeration in the number of sentenced prisoners in proportion to population. Does this decrease foreshadow a wane of crime? No one can tell. Probably not. But, if not, this decrease at least denotes that imprisonment has ceased to be the sovereign means of dealing with certain classes of offenders. The period of fourteen years since the census of 1890 has been marked by the establishment of the probation and parole systems, by a movement against the use of the short-term sentence, and by the introduction of other substitutes for imprisonment. How many minor offenders thus escape the stigma of imprisonment and are given the benefit of custodial supervision outside prison walls no one knows. In the aggregate their numbers are sufficient to account for the decrease alluded to in the prison population. If, then,

the latest available figures do not indicate a diminution in criminal offences, they denote unmistakably a signal progress in methods of dealing with criminals. It is significant that in States which adhere to antiquated methods of dealing with criminals the ratio of prisoners to population shows no signs of diminution but rather the reverse.

While the general prison population shows a slight diminution in proportion to population, the percentage of colored prisoners increased from 30.4 in 1890 to 32.6 in 1904. This increase in the proportion of colored prisoners was particularly notable in the North Central States, where 14.2 per cent. of the prisoners enumerated in 1890 were colored, as contrasted with 20.5 per cent. in 1904.

It is also evident that the colored furnish a disproportionately large part of the prisoners. According to the last census, the whites formed 87.9 per cent. of the general population, yet only 67.4 of the prisoners were white. The colored formed 12.1 per cent. of the general population, but furnished 32.6 per cent. of the prisoners. For each State and Territory, with the exception of Arizona, the percentage of colored among prisoners was in excess of the percentage that the colored formed of the total population. The differences in the proportions of colored prisoners in the different States are, to a considerable extent, the results of divergent local conditions. High percentages may, in some instances, reflect greater severity in dealing with colored criminals than with the white. There is, however, no escape from the conclusion that relatively the colored contribute much the larger number to the prison population, for this condition exists in States with a small admixture of colored as well as in States in the "black belt" of the South.

Unlike the colored, the foreign-born white appear to be of decreasing importance among prisoners. In 1890 the immigrant class formed 28.3 per cent. of the total number of white prisoners, but by 1904 this percentage had decreased to 23.7. On the other hand, the percentage of native white

in the total number of white prisoners increased from 71.8 in 1890 to 76.3 in 1904.

This change is common to all sections of the country. Even the North Atlantic States, which have absorbed most of the late immigration, show a larger percentage of native prisoners and a smaller percentage of foreign than they did in 1890. It is evident, therefore, that the recent huge additions of foreigners to the population are not reflected in the prison returns in the degree the prison statistics of 1890 might have led one to expect.

A diminished percentage of foreign-born prisoners in 1904 as compared with 1890 does not prove, however, that the foreign-born now contribute to the prison class in smaller proportion than to the general population. The most reasonable basis for determining this is obtained by comparing the percentage of foreign-born among white prisoners with the percentage of the foreign-born in the general white population fifteen years and over, as nearly all prisoners are over fifteen years of age. Such a comparison shows that, while the foreign-born formed 23.7 per cent. of all white prisoners, only 21.9 per cent. of the general white population (census of 1900) fifteen years of age and over were foreign-born. These figures give little support to the popular belief that the foreign-born contribute to the prison class greatly in excess of their representation in the general population. The North Atlantic States group is the only important one where the foreign-born are relatively more numerous among the white prisoners than in the general white population. In the North Central States, on the other hand, the foreign-born form 23.3 per cent. of the general white population of the ages under consideration, but only 16 per cent. of the prisoners. As no allowance has been made for the great influx of foreign-born since 1900, which affects chiefly the North Atlantic States, the figures presented cannot be regarded as indicating a greater criminal tendency among the foreign-born whites than among the native. These conclusions are generally

substantiated by the facts ascertained concerning the prisoners committed during 1904.

So far I have drawn the facts from the enumeration of prisoners on a given date in 1904. In order to obtain a clearer picture of the prison population of the present time and at least an indication of the movement of the population in prisons, a separate enumeration was made of all persons committed to prisons during the twelve months of 1904. As no similar enumeration has ever been attempted, no comparisons can be made with an earlier period.

The prison population on June 30, 1904, numbered 81,722. During 1904 a total of 149,691 prisoners were committed in the United States on term sentences. Assuming the number 81,722 to represent the average number in prisons on any given date, it will be seen that the prison population on any fixed date constitutes about 54.6 per cent. of the number committed on term sentences during the year.

For Continental United States the commitments to prisons during 1904 numbered 184.1 in each 100,000 of population. The ratios of commitments in the various States differ widely. In Alabama, for instance, the ratio was 55.7 commitments per 100,000 of population; in Illinois, 80.5; but in Massachusetts, 482.3; and in California, 523.4. To infer that actual conditions of criminality are truly reflected by such ratios would be contrary to all known facts. For example, although Illinois has a population twice as large as that of Iowa, the number of commitments in Iowa was larger than in Illinois. This can have but one meaning; namely, that different standards in the prosecution and punishment of crime prevail in the two States. The attitude of the public in regard to the punishment of minor offences has a marked effect upon the kind of sentence imposed, and this in turn affects the ratio of prisoners to population. In the States where drunkenness, disorderly conduct, vagrancy, and violations of local ordinances are rigidly prosecuted and frequently punished by imprisonment on a term sentence,

the ratio of prisoners to population must, of necessity, be larger than in communities that follow a more lenient course. To put it differently, the widely divergent ratios of prisoners committed to population are determined largely by the use of the term sentence in dealing with minor offenders.

More than one-half of all the persons sent to prison in the United States on a term sentence during 1904 were committed for the offences of drunkenness (23.2 per cent.), disorderly conduct (11.5 per cent.), and vagrancy (18.9 per cent.). In other words, more than one-half of the persons sent to prison in the course of a year had been convicted of violations of law that do not necessarily imply a criminal bent in those perpetrating them. Comment is hardly necessary.

In all, 10.4 per cent. of the prisoners committed in 1904 had been convicted of some offence against the person. Among these, 2,444 persons were imprisoned for homicide. For Continental United States this is equal to a ratio of 3 in each 100,000 of population. Arizona, Nevada, Texas, Louisiana, New Mexico, and Kansas, in the order named, are the half-dozen States with the largest ratios to population of persons committed for homicide. The reason why the ratio for Kansas is higher than for any other state of the North Central group is probably that a United States prison is located in that state. The highest ratio in any State of the North Atlantic division, 1.9, was in Pennsylvania. The ratio reported for Wisconsin and Minnesota (namely, 0.7) is notably small.

Relative to population, the largest number of commitments for robbery and for rape (respectively, 3.9 and 1.4 per 100,000 inhabitants) occurred in the States of the Western division. In each 100,000 of population there were 17.8 commitments for burglary in the Western division, and 10 in the North Atlantic States. These two State groups have the largest ratios.

Before passing to a brief consideration of the relation of

sentences to offences, a word should be said about the short-term sentences. For Continental United States 29.4 per cent. of the prisoners committed during 1904 were sentenced for less than thirty days, and 67.2 per cent. for less than four months. The employment of sentences for less than thirty days does not appear to stand in the close relationship one might expect to the number of minor offences involved. In Massachusetts, for instance, where an unusually large proportion of the prisoners committed had been guilty of minor offences, such as drunkenness and vagrancy, only 9.8 per cent. were sentenced for less than thirty days, whereas in Illinois, with comparatively few commitments for these two offences, 34.5 per cent. of all prisoners were incarcerated for less than thirty days. The abuse of the short-term sentence is particularly conspicuous in the North Central and Western States. On the whole the terms of sentence for minor offences reveal strangely inconsistent and, to a large extent, futile policies in the use of repressive measures in combating crime.

In regard to sentences for specific crimes it is found that the severity of the penalties imposed often appears to bear little relation to the gravity of these crimes as implied by their titles. For example, no less than 21.3 per cent. of the persons sentenced for adultery were sentenced to terms of less than thirty days' imprisonment. On the other hand, the crime of fornication was, in a number of instances, punished by imprisonment for periods varying from three to fifteen years, and in some cases longer. It is also curious to find the offence of disorderly conduct meriting imprisonment from six to nine years, and violations of liquor laws calling for even a severer punishment. In such instances it is probably to be assumed that the crime formally charged was not the only one of which the defendant had been guilty.

Of the 2,444 persons committed for homicide in 1904, but 106, or 4.3 per cent., were sentenced to death and awaiting execution of sentence. The largest percentages of persons

guilty of homicide who were sentenced to death were found in the North Atlantic and Western States. Yet the North Atlantic States had the lowest ratio of homicides in 1904, (namely, 1.4 per 100,000 of population), while the Western had a ratio of 4.8, or the second. In the six States, excepting Pennsylvania, with the largest numbers committed for homicide,—namely, Kentucky, 147; Tennessee, 134; Alabama, 120; Mississippi, 138; Louisiana, 154; and Texas, 150,—only four of this great number of persons found guilty of homicide were condemned to die,—three in Texas and one in Mississippi. Of the whole number committed for homicide, only 24 per cent. were sentenced for life, 26 per cent. for terms of one to five years, and 37.1 per cent. for from six to twenty-one years and over, etc. However we may construe them, these figures are exceedingly impressive.

In order to gain a clearer meaning of the crime movement as represented by the commitments to prisons and perhaps some inkling of the criminal proclivities of the various groups of offenders, the prisoners were classified as major and minor offenders. All crimes that are universally held to be of a grave nature, regardless of how they happen to be punished, were invariably classed as major offences. In regard to larceny and a number of other offences, which may or may not be of a serious nature, the rule was followed of classifying them as minor offences when the term of imprisonment was not for more than one year. Time permits only the briefest summary of some facts gleaned by classifying the prisoners as major and minor offenders.

It is significant that in each of the geographic divisions, and in most of the States and Territories, the percentage of colored was larger among the major offenders. In other words, the colored contribute relatively a larger number of dangerous criminals to the prison population than the whites. It may be remarked, in passing, that, of the colored major offenders, 13.4 per cent. had been committed for homicide as against 6.6 per cent. of the white.

While commitments to prison for 1904 show the popular belief that the foreign-born are filling the prisons to have little foundation in fact, it is also apparent that the foreign-born whites are slightly more prone than the native whites to commit minor offences. What is true, however, of the foreign-born generally, does not apply equally to the various groups of nationalities entering into the foreign-born prison population.

There were committed, during 1904, 35,093 white prisoners of foreign birth. The extent to which the various foreign-born nationalities are factors in the prison population, and thus in the criminal class of society, can be fairly well tested by comparing the per cent. distribution, by country of birth, of the foreign-born prisoners committed with the per cent. distribution of the total foreign-born population of the country. Such a comparison shows that persons born in Austria, England and Wales, Ireland, Italy, Mexico, and Scotland, formed a larger proportion of the foreign-born prisoners committed during 1904 than of the total foreign-born population. This was not true of the white prisoners born in Canada, Denmark, France, Germany, Hungary, Norway, Poland, Russia, Sweden, and Switzerland. The first-mentioned group of countries furnished 35.3 per cent. of the white foreign-born population (in 1900), but 59.3 per cent. of the foreign-born prisoners. The last-mentioned group of countries furnished 58.8 per cent. of the foreign-born population (in 1900), yet only 36.5 per cent. of the foreign-born prisoners.

The Irish constituted 15.6 per cent. of the total foreign-born, but contributed 36.2 per cent. of the prisoners, and was by far the most largely represented nationality among the foreign-born prisoners. Relative to their numerical representation and importance among the foreign-born peoples of the United States, the Germans are the least conspicuous among the foreign-born prisoners.

This relation of the various foreign nationalities to crime

assumes another aspect when the prisoners are classified as major and minor offenders. The following countries contributed percentages of major offenders in excess of their relative representation among the foreign-born population: Austria, Canada, France, Hungary, Italy, Mexico, Poland, Russia, and Scotland. Comparisons of this sort are, of course, not conclusive evidence of the criminal tendencies of the different nationalities. Yet it is highly significant to learn that, while the Irish, as stated, contributed 36.2 per cent. of all the foreign-born prisoners committed in 1904, they furnished only 10.7 per cent. of the foreign-born major offenders, or a smaller percentage than the Italians, Canadians, and Germans.

In this connection it is of interest to touch upon the relative frequency of the different offences among the several nationalities of foreign-born prisoners. The Canadians, Poles, English, and Welsh, in the order named, lead in offences against chastity. The Italians stand at the head in crimes of violence. Of the foreign-born committed for homicide, the Italians form 16 per cent. as compared with 3.6 per cent. of the Irish. The Italians are also most conspicuous for the crimes of robbery and for rape. On the other hand, the Italians show the lowest percentage of major offenders against property (30.1 per cent.), and the English and Welsh the highest (69.7 per cent.), followed by the Russian (66.5). The Poles and Russians lead in percentage of prisoners committed for arson, Mexicans, English, and Welsh in the percentage committed for burglary, and the Russians in the percentage committed for larceny.

The percentages of minor offenders committed for drunkenness and disorderly conduct run from 28 per cent. among the Italians to nearly 63.9 per cent. among the Irish. In general, the foreign-born show larger percentages sentenced for drunkenness and disorderly conduct, but violations of the liquor laws and vagrancy were relatively more frequent among the native-born.

In conclusion, a single question: Are we making a wise and careful use of imprisonment as a means not only of repressing crime, but of reforming criminals? In answer I shall merely offer some facts in regard to the ages at which prisoners are committed. More than 14,000 of the prisoners committed in 1904 were under twenty years of age, and 685 were under fifteen years. As the reformatories in the country would not even hold such a number, and besides receive many who are over twenty-one years of age, it is evident that we annually send thousands of youthful offenders to penal institutions primarily designed for the safe keeping of the offender, and not for his reformation. Moreover, one would hardly dare assert that the age of possible reformation stops at twenty years. There is still hope for many who are under thirty years of age. Yet the fact is that more than 50,000 of all the prisoners committed in 1904, or nearly 35 per cent., were between twenty and twenty-nine years of age, and that most of them were confined in penal institutions conspicuously wanting in everything which could stimulate to a clean and upright life.

REVIEWS.

SPECIAL REPORTS ON SPECIAL CLASSES OF THE POPULATION.

Benevolent Institutions, 1904; *Paupers in Almshouses*, 1904; *Insane and Feeble-minded in Hospitals and Institutions*, 1904. Prepared under the direction of Mr. John Koren, and published by the Bureau of the Census, Washington, D.C., 1905 and 1906.

Benevolent Institutions, 1904.

This report published in 1905 was the first of the series of reports to deal with special classes. By benevolent institutions is meant all institutions "supported wholly or in part by public taxation, private endowment, or subscriptions, donations, and other forms of gift, for the benefit of the sick, aged, and needy." There were so many institutions of a mixed character that it was found difficult in many cases to draw a line of demarcation between those that should and those that should not be included in the inquiry. Free dispensaries, day nurseries, and special schools for the deaf and blind, if they served also as homes, were included in the inquiry.

It was possible to tabulate only the more elementary facts regarding such a heterogeneous group of institutions, if for no other reason than a lack of uniform methods of keeping reports and accounts in the various institutions. Returns were secured from 4,207 benevolent institutions. Of this number 1,493 were hospitals, 1,075 orphanages and children's homes, 753 permanent and 499 temporary homes for adults or adults and children, 166 nurseries, 156 dispensaries, and 115 schools and homes for the deaf and blind. The growth in the number of these institutions is shown by single years for the period 1890–1903. The statistics also show the movement of the institutional population during the calendar year 1904 and the number of inmates remaining on Dec. 31, 1904. The financial statistics show for each institution the cost of maintenance during 1903, together with the amount of income from annual subsidies from public funds and the receipts from pay patients.

This report will be of special value to all charity workers, as it is admirably adapted for use as a handbook and directory. The form in which the tables have been cast could not easily be improved upon, and the general arrangement of the data is such that the information wanted may be found with a minimum amount of time and effort.

Paupers in Almshouses, 1904.

This report was the second of the series dealing with special classes of the population, and was published in 1906. The delay in publication was due to the provision of the Act of Congress of March 6, 1902, establishing a permanent Bureau of the Census, which stipulated that the enumeration of the special classes of the population must be deferred until the completion of the census reports on Agriculture and Manufactures. As a result of this provision of the law, the enumeration of the special classes was not begun until three years after the enumeration of the general population in 1900.

The collection of the data was principally by schedules filled out by the various almshouse officials who acted as paid special agents of the Bureau of the Census. The inquiry was limited to inmates of almshouses, so this method of enumeration was feasible. From another point of view, however, the limitation of the inquiry (by the law of March 6, 1902) to almshouse population was perhaps unfortunate. What are wanted above all else are statistics of poverty and pauperism which will enable us to judge of the complete extent of the same. While this ideal is impossible of attainment at the present time for the United States as a whole, fairly complete data could undoubtedly be secured for certain States and smaller localities if the Bureau of the Census could co-operate with the local authorities. The present report is a model for its kind, both in the arrangement of the tables and in the method of analytical treatment. When outdoor pauperism has been as adequately considered as the indoor, or almshouse, paupers have been in this report, there will no longer be any excuse for passing off guess-work as facts or wild exaggeration as sober truth in statements of the extent of poverty and pauperism in this country.

The enumeration of the dependent poor in almshouses was made as of Dec. 31, 1903, but additional schedules dealt with paupers admitted to almshouses during the year 1904 and with discharges, deaths, and transfers during the same period. The careful and intelligent survey of the movement of the almshouse population during the year has resulted in the collection of some exceptionally valuable

data, the analysis of which established certain facts either heretofore unknown or at best largely a matter of guess-work. The innovation of counting the almshouse population in winter when it is largest is an improvement over the previous method of making the enumeration on the census date of June 1, when the almshouse population is considerably reduced by the spring migration of the more able-bodied inmates. It would have been desirable, if practically possible, to have had a statement of the movement of the almshouse population by months, so that a truer average could have been obtained than is now possible. This would have been particularly useful in connection with the mortality statistics.

The report deals with 81,764 paupers in 2,476 almshouses on Dec. 31, 1903; 81,412 paupers admitted to almshouses during 1904; 54,199 discharges; 17,154 deaths; and 6,533 transfers from almshouses to other institutions. Comparison with previous censuses indicates an apparently decreasing ratio of almshouse inmates to total population. There are exceptions, notably in the Western States, where, however, the higher ratios are due to recently provided and ampler facilities for the institutional care of paupers rather than to any exceptional increase in pauperism. On the other hand, in some of the other more populous and more urbanized States, such as New York and Massachusetts, the decline in the ratios of almshouse paupers to total population is largely due to changes in methods of almshouse administration, more effective poor laws, and a more scientific classification of the dependent and defective classes. Organized charity, too, which has developed rapidly of late in certain States, should operate to reduce the number of dependents in almshouses.

There are usually more males than females in almshouses. On Dec. 31, 1903, there were 52,444 males and 29,320 females in the almshouses of the United States. The disproportion of the sexes was greatest in the Western States, where the males constituted 87.4 per cent. of the total, and least in the Southern States, where the males formed 51.7 per cent. of the total in the South Atlantic and 51.3 per cent. in the South Central States. Women remain more permanently in almshouses, when once admitted, and the male element is always a more or less transient class. In the Northern States, especially, many males board at almshouses during the winter and are discharged in the spring. In the South, owing to the mild climate and peculiar industrial conditions, male inmates of almshouses are generally more thoroughly dependent than in the Northern and Western States. The females actually outnumber the males among

the native white paupers of native parentage in some of the Southern States.

On Dec. 31, 1903, there were 7,435 colored paupers in almshouses, of whom 6,910 were negroes, 73 Indians, and 44 Mongolians. The ratio of all colored paupers to 100,000 of colored population was 75.2 as compared with 74.6 for the native white and 314.6 for the foreign-born white populations. The comparatively low ratio of negro paupers does not indicate exceptional or even average thrift, but is due to the general lack of adequate institutional facilities in the South and to the ability of the negro to subsist on a pittance.

The following table brings out clearly the relative distribution by nativity of the white paupers in almshouses compared with the general population:—

COMPARATIVE STATEMENT OF PAUPERS BY NATIVITY.

Nativity.	Percentage Distribution of	
	General Population (1900).	Almshouse Population (Dec. 31, 1903).
Native of native parents	61.3	46.4
Native of foreign parents	15.9	7.8
Native of mixed parentage	7 5	2.6
Foreign-born	15.3	43.2
Total	100.0	100.0

This table shows that the foreign-born contribute much more heavily to the almshouse population than their proportionate number in the general population would warrant. The favorable age distribution accounts for the relatively small percentage (7.8) which the native-born of foreign parents form of the total almshouse population. Pauperism is a problem of old age or at least of well-advanced adult ages, but at ages 60–64, for example, only 10.2 per cent. of the total white population are native-born of foreign parents, while 89.8 per cent. are native-born of native parents. If it were possible to make the proper corrections for age, it would undoubtedly appear that the native-born of foreign parents contribute more largely to the almshouses than their proportionate numbers in the general population would warrant, and considerably more than do the natives of native parents.

The detail figures for the foreign-born paupers are of interest, and the following table brings out some interesting facts:—

COMPARATIVE PERCENTAGE DISTRIBUTION OF THE TOTAL FOREIGN-BORN POPULATION AND THE FOREIGN-BORN POPULATION IN ALMSHOUSES.

Country of Birth.	Total Foreign-born Population, Census of 1900.	In Almshouses, Dec. 31, 1903.	Admitted to Almshouses, 1904.
Ireland	15.6	46.4	41.2
Germany	25.8	23.3	18.4
England and Wales	9.0	8.7	8.8
Canada	11.4	4.8	6.5
Scandinavia	10.3	4.9	4.9
Scotland	2.3	2.5	2.6
Italy	4.7	1.0	3.1
France	1.0	1.4	1.3
Hungary and Bohemia	2.9	1.0	1.5
Russia and Poland	7.8	1.5	3.4
Other countries	9.2	4.5	8.3
Total	100.0	100.0	100.0

The very large actual and proportionate number of Irish found in almshouses is very clearly shown. No other foreign-born element of the population approaches the Irish in the actual or proportionate numbers which are contributed to the almshouse population. In this connection we recall an essay by Mr. Byron C. Matthews, entitled "A Study in Nativities," which appeared in the *Forum* of January, 1899. The study was based upon the institutional population of New York City, and the Irish were found to outnumber all the other foreign-born in the almshouses. The figures presented in the report under review conclusively show that this preponderance of the Irish-born element in almshouses is not a local phenomenon.

An analysis of the statistics of length of residence in this country lends no support to the contention that large numbers of immigrants drift into almshouses soon after their arrival in this country. Only 2.3 per cent. of all the foreign-born inmates of almshouses on Dec. 31, 1903, had resided five years or less in the United States, while 96.1 per cent. were reported as having lived here ten years or more.

This report is of special value because of its excellent treatment of the subject of age. The attained ages of the paupers in almshouses are given, but most important of all are the facts in detail, showing the ages at admission. The statistics show that pauperism

is principally a phenomenon of advanced age. For example, 34.7 per cent. of the males admitted to almshouses in 1904 were aged sixty years and over, while 30.8 per cent. of the female admissions were of these ages. Of the paupers found in almshouses on Dec. 31, 1903, 69 per cent. were admitted at ages forty and over. The tables also show that females are admitted at somewhat earlier ages than males, and that a larger proportion of negroes are admitted at the young and very old ages than is true of the white paupers. The foreign-born do not appear to drift into almshouses at earlier ages than the native-born.

Other facts tabulated and analyzed are: marital condition of paupers; literacy; occupation; condition for work (whether able-bodied or incapacitated); mental and physical defects; the mobility of the almshouse population as indicated by the admissions, discharges, deaths, and transfers during 1904; children of pauper mothers; and children under sixteen years of age in the pauper population in almshouses.

It is a matter for regret that more facts are not available on the general subject of institutional mortality. What are needed are more complete and accurate statistics which will show the age, sex, color, or race, nativity, cause of death, duration of illness, and whether the illness is contracted before or after admission to the institution. This report makes a good beginning along this line, as it gives the first four of the items just enumerated (namely, age, sex, color, and general nativity) for the pauper deaths in almshouses during 1904. The high average age of the almshouse population and the high percentage of defectives among this class would lead us to expect a high general death-rate. The average age of paupers admitted to almshouses in 1904 was 49.4 years; and, of the white paupers admitted, 53.5 per cent. were rated as physically or mentally defective, and of the negro admissions no less than 58.2 per cent. had a reduced vitality due to physical or mental impairments. Of the total almshouse population on Dec. 31, 1903, 20.2 per cent. were rated as feeble-minded, 17.4 per cent. as old and infirm, 13.6 per cent. as crippled, maimed, or deformed, 10.3 per cent. as insane, 5.8 per cent. as rheumatic, 4.7 per cent. as paralytic, 3.6 per cent. blind, 1.7 per cent. as epileptic, and 0.9 per cent. as bedridden. No less than 79 per cent. of the total almshouse population on Dec. 31, 1903, were rated as defective, and of the total admissions to almshouses during 1904 53.8 per cent. were thus classified.

During the calendar year 1904 there were 17,154 deaths of paupers in almshouses. Taking the mean of the population in almshouses

on Dec. 31, 1903 (81,764), and of that remaining in almshouses on Jan. 1, 1905 (85,290), it appears that 20.5 per cent. of the average almshouse population during 1904 died during that year, or equivalent to an annual death-rate of 205 per 1,000 of paupers exposed on the average one year. It would seem to be a fair assumption that the mean of the almshouse populations at the beginning and end of the year, when the enumerations are made in winter, will represent a number somewhat in excess of the actual number of paupers exposed to death a year, on the average, inasmuch as the almshouse population is considerably reduced during the summer months. On this assumption I have compiled the following table to indicate the approximate mortality rates of paupers in almshouses, with distinction of age, race, and sex:—

MORTALITY OF PAUPERS IN ALMSHOUSES, 1904.

Rates per 1,000 of the Mean of the Number of Paupers, Dec. 31, 1903, and Jan. 1, 1905.

Ages.	White.		Colored.	
	Males.	Females.	Males.	Females.
Under 5	268	260	198	164
5 to 14	30	26	69	102
15 " 24	219	115	569	460
25 " 34	251	139	613	401
35 " 44	207	123	493	312
45 " 54	178	104	397	242
55 " 64	149	131	416	259
65 " 74	172	185	424	320
75 " 84	242	247	457	313
85 and over	355	340	421	362
All ages	197	166	464	330

These figures indicate an exceptionally high mortality rate at all ages. They also show that the mortality is higher among males than among females at all ages, and that the death-rates for the colored are uniformly higher than for the white paupers. The high death-rates at the ages 15–44, when we would not expect in a normal population a higher rate than from 5 to 15 per 1,000, suggest that the almshouse paupers of those ages are very largely persons seeking hospital treatment. Among the colored male inmates of almshouses of ages 25–34 no less than 613 of every 1,000, or over 61 per cent. of the total, died during 1904. Of course, many of these persons must

have entered the almshouses in an almost dying condition, otherwise such a high death-rate would be impossible. The rates, even if considered only approximate, are extremely suggestive, and it is to be hoped that in the near future data will be available to make possible the calculation of more accurate death-rates for paupers in almshouses.

Insane and Feeble-minded in Hospitals and Institutions, 1904.

This report, published in 1906, is similar in its general arrangement to that on paupers in almshouses. Among other interesting facts it shows that the insane in hospitals have increased rapidly in recent years. On Dec. 31, 1903, there were 150,151 insane persons in 328 hospitals. Of the total hospitals, 226 were public and 102 private institutions. As the report deals only with the insane in hospitals, it is impossible to say definitely whether insanity has increased faster than population in this country. A considerable part of the apparent increase of the insane in hospitals was undoubtedly the result of ampler hospital facilities, better legislation, and a more scientific classification of the dependent and defective classes. Making due allowance for these factors, however, it still seems reasonable to assume that insanity has increased somewhat faster than population, at least during the thirteen years 1890–1903.

The statistics in this report make it possible to assert that, if insanity is on the increase, it is increasing faster among males than among females.

Of the 150,151 insane persons in hospitals on Dec. 31, 1903, 78,523, 52.3 per cent., were males, and 71,628, or 47.7 per cent., were females. Of the admissions during 1904, 55.2 per cent. were males, and only 44.8 per cent. were females.

Insanity is not unduly frequent among the colored population, though it is apparently most so in the Northern States. The low hospital rate of the colored is, however, doubtless due to lack of adequate hospital accommodations rather than to any special immunity of the colored to insanity.

As in almshouses, the Irish-born element of the population contribute to the insane population of hospitals out of all proportion to their numbers. While only 15.6 per cent. of the total foreign-born population in the United States in 1900 were born in Ireland, this element constituted 29.0 per cent. of the total insane in hospitals on Dec. 31, 1903.

The statistics of age are of special value, particularly as they show the age of the patients at the time of their admission to hospitals.

The tables under this head will repay careful study by all those interested in this branch of medico-social statistics. The average age at admission was 38.5 years for the aggregate insane in hospitals on Dec. 31, 1903, and for males the average was 37.9, and for females 39.1. The average age of the colored insane was about three years less than for the white insane.

Of the total insane in hospitals on Dec. 31, 1903, 10.9 per cent. were physically defective: of the males 12.6 per cent. were physically defective, and of the females 9.1 per cent. A somewhat higher percentage of the negro insane, or 11.3 per cent., were physically defective, the larger part, or 7.8 per cent., being epileptics.

During 1904 there were 14,434 deaths reported in hospitals for the insane. The following table shows the approximate mortality rates with distinction of age, race, and sex. In explanation of the method used in calculating the rates, I would say that the mean of the aggregate numbers of insane in hospitals on Dec. 31, 1903, and on Jan. 1, 1905, has been taken for the average aggregate number of insane exposed to death one year. The percentage age distribution of the insane in hospitals on Dec. 31, 1903, has been applied to this mean number. On this basis the death-rates for the insane in hospitals during the calendar year 1904 were as follows:—

MORTALITY OF THE INSANE IN HOSPITALS, 1904.

Rates per 1,000.

Ages.	White.		Colored.	
	Males.	Females.	Males.	Females.
Under 20	81	93	152	135
20 to 24	56	69	110	161
25 " 34	26	61	84	116
35 " 44	75	54	104	100
45 " 54	75	58	78	48
55 " 64	120	80	161	123
65 " 74	262	153	279	365
75 " 84	444	274	296	247
85 and over	522	453	778	294
All ages	101	81	125	123

These rates were generally lower than those for the paupers in almshouses, except at ages 75 and over. The mortality of males was higher than that of females at almost all ages. The mortality

of the colored insane was considerably in excess of that of the white insane at nearly all ages.

It would have been of interest to know the causes of death of the 14,434 deaths in insane asylums, and the percentage distribution by specified causes would have contributed not a little to our knowledge of the mortality of the insane.

The latter part of this report deals with the feeble-minded in special institutions for that class of the population. Only 14,347 inmates were found in such institutions on Dec. 31, 1903, although competent authorities estimate that at least 150,000 persons in the United States are so pronouncedly feeble-minded as to stand in need of institutional treatment. The limitation by law of this inquiry to inmates of special institutions impaired its value very seriously.

Of the feeble-minded in special institutions 30.2 per cent. were physically defective. This is an important fact to keep in mind when considering the relatively high mortality rates of the feeble-minded as presented in the following table:—

MORTALITY OF THE FEEBLE-MINDED (WHITE AND COLORED) IN SPECIAL INSTITUTIONS, 1904.

Rates per 1,000.

Ages.	Males.	Females.
Under 5	108	133
5 to 14	31	31
15 " 24	45	29
25 " 34	40	40
35 " 44	56	49
45 " 54	71	56
55 and over	91	103
All ages	41	36

In the calculation of these rates the same method was employed as in calculating the mortality rates of paupers in almshouses and of the insane in hospitals. It was not worth while in this case to separate the white and colored, as only 10 of the 574 deaths were colored. In comparing these mortality rates with those for the paupers and the insane, it is necessary to bear in mind the fact that the age distribution of the feeble-minded is favorable to a lower mortality than is true for either paupers or insane. More than three-fourths of all the admissions to special institutions for the feeble-minded during

1904 were under twenty years of age, and nearly 60 per cent. were of ages under 15. In view of this fact the rates must be regarded as excessive.

In concluding this review, it may not be amiss to refer the reader to a critical analysis of the defects, limitations, and restrictions in the law under which the investigations of the dependent, defective, and delinquent classes were made. These criticisms were made by Mr. Koren in a brief paper contributed to these publications, Vol. VII., No. 54, and they furnish the reasons why it is that the census publications under review do not contain full and sufficient answers to many important questions, such as What is the extent of pauperism in the United States or in any part thereof? Is insanity on the increase in this country? and How prevalent is feeble-mindedness in our population? It is to be hoped that the law will be amended in many important particulars before the next enumeration of the "Special Classes" is made.

F. S. CRUM.

MORTALITY STATISTICS.

Annual Report upon the Health of Blackburn, England, for the Year 1906. By Alfred Greenwood, M.D., D.P.H.

The annual reports of the Medical Officer of Health of Blackburn, England, have been of special value since 1890, when Dr. Barwise, then Medical Officer of Health, began the careful compilation of the mortality statistics of the cotton operatives. The work begun by Dr. Barwise has been continued by his two successors in office, Dr. James Wheatley from 1891 to 1901 and Dr. Alfred Greenwood from 1902 to the present time. Returns of 4,844 deaths of cotton operatives in Blackburn aged 15 and over are now available for analysis. These deaths occurred during the eighteen-year period 1889–1906, and distinction is made of age and four principal groups of occupations; namely, Weavers, Spinners, Warpers, Winders, etc., and Card-room Hands. Distinction of sex is made only in the statistics of weavers. Principal causes of death by specific occupation are noted in the detail tables at the end of the report, but emphasis has been placed upon consumption and respiratory diseases, as these are the causes of death to which cotton operatives are especially liable.

The annual report for 1906 contains a fifteen-year (1891–1905) summary of the mortality returns, arranged in three five-year periods.

The more important results of this summary are shown in the following condensed tables:—

AVERAGE DEATH-RATES * AMONG WEAVERS, 1891–1905.

Ages.	Consumption.			Respiratory Diseases.		
	1891–95.	1896–1900.	1901–05.	1891–95.	1896–1900.	1901–05.
15 to 24 . .	1.0	1.1	0.9	0.7	0.4	0.2
25 " 34 . .	2.1	1.5	1.1	1.1	0.6	0.4
35 " 44 . .	2.1	2.3	1.7	3.0	1.8	0.7
45 " 54 . .	1.1	2.4	1.5	5.9	4.0	3.9
55 " 64 . .	2.7	2.9	1.8	16.5	14.3	10.7

AVERAGE DEATH-RATES OF MALE AND FEMALE WEAVERS, 1891–1905.

Ages.	All Causes of Death.					
	Males.			Females.		
	1891–95.	1896–1900.	1901–05.	1891–95.	1896–1900.	1901–05.
15 to 24 . .	6.1	4.6	2.9	3.4	3.3	2.5
25 " 34 . .	7.3	6.2	4.2	6.0	4.3	3.8
35 " 44 . .	14.0	12.1	7.4	10.7	8.1	6.5
45 " 54 . .	19.1	23.7	16.1	9.1	7.1	11.2
55 " 64 . .	69.1	43.7	39.6	26.8	29.4	24.6

AVERAGE DEATH-RATES * AMONG SPINNERS, WINDERS, AND WARPERS, 1891–1905.

Ages.	All Causes of Death.					
	Spinners.			Winders and Warpers.		
	1891–95.	1896–1900.	1901–05.	1891–95.	1896–1900.	1901–05.
15 to 24 . .	7.5	3.7	2.7	4.8	5.4	2.6
25 " 34 . .	7.7	7.2	7.7	8.6	6.1	4.7
35 " 44 . .	13.2	10.2	6.9	12.5	10.8	5.9
45 " 54 . .	34.2	23.3	22.3	25.8	21.6	10.7
55 " 64 . .	48.2	23.4	42.4	42.5	35.6	20.8

* Rates per 1,000 employees of the specified ages.

AVERAGE DEATH-RATE* AMONG CARD-ROOM HANDS, 1891–1905.

Ages.	Card-room Hands.		
	1891–95.	1896–1900.	1901–05.
15 to 24	4.2	3.1	2.8
25 " 34	7.9	4.0	2.3
35 " 44	12.5	7.9	5.8
45 " 54	21.7	16.3	16.2
55 " 64	34.5	23.9	15.8

The rates given in the above tables are as calculated by the Medical Officer of Health. For the period 1891–1895 the trade census of 1891 was taken as the basis for the number of employees; for 1896–1900 the mean populations of the trade censuses of 1891 and 1901 were taken; and for 1901–1905 the trade census of 1901 was used as the basis for calculating the death-rates. As the Medical Officer points out, a quinquennial census is highly desirable in occupational inquiries of this kind, but he adds "it has been recommended so often by leading Medical Officers of Health throughout the country that one despairs of this important measure ever becoming law."

Comment upon the death-rates as presented in the summary tables is hardly necessary except to state that they seem to indicate quite positively "that the conditions under which operatives work in Blackburn have improved enormously, and that the death-rates among them improve continually."

For a more extended review and criticism of these reports see "The Health and Mortality of the Cotton Mill Operatives of Blackburn, England," *Medical Record*, Aug. 11, 1906.

F. S. C.

POPULATION STATISTICS.

Compendium of Censuses, State of New Jersey, 1726–1905, *together with Tabulated Returns of* 1905. Trenton, N.J., 1906.

In a brief compass this volume contains the aggregate population of the various municipalities of New Jersey as returned by the different censuses, State and national. The municipalities are arranged in alphabetical order by county divisions, and, as the counties are also in alphabetical order, the compendium is a very convenient

* Rates per 1,000 employees of the specified ages.

and valuable book of reference. The present name of the municipality is given, but changes of name and changes in boundary are indicated either in the body of the table or in foot-notes.

"Upon the surrender of East and West Jersey by the proprietors, Her Majesty Queen Anne appointed Lord Cornbury governor of this province, November 16, 1702, and in her letter of instructions of that date directed him to 'send an account unto us, and to our commissioners for trade and plantations, of the present numbers of planters and inhabitants,' etc. This seems to be the first enumeration of the province ordered, whether it was made is doubtful, as no records of it have yet been found, either here [Trenton] or in the record office in London. This makes the census of 1726 which was returned by Governor William Burnet to the Lords of Trade, May 9th, 1727, the first of record."

Enumerations by counties were made also in 1737, 1745, and 1784. In 1790 the first national census was taken, and in 1855 and at ten year intervals since that date the State has made enumerations of its population.

The population of the State of New Jersey as returned by the various censuses is given in the following summary:—

POPULATION OF NEW JERSEY, 1726–1905.

Year.	Population.	Year.	Population.
1726	32,442	1855	569,500
1737	47,369	1860	672,035
1745	61,403	1865	773,500
1784	149,435	1870	906,096
1790	184,139	1875	1,020,584
1800	211,149	1880	1,131,116
1810	245,562	1885	1,278,033
1820	277,575	1890	1,444,933
1830	320,779	1895	1,673,106
1840	373,306	1900	1,883,669
1850	489,555	1905	2,144,143

The census returns for 1905 are given for each municipality and township arranged by counties. The following facts are given for each statistical division: Number of *dwellings*; Number of *families; White* and *Colored* population, by sex; *Age*, with distinction of sex (under 5, 5–18, 18–21, 21–45); *Conjugal relation* (*single*, by sex; *married, widowed*, and *divorced*, without distinction of sex); *Nationality* (*American* born, *English, Irish, German, Italian*, and *All others*);

Number of persons *Naturalized; Occupation* (*Professions, Commercial pursuits, Skilled laborers, Unskilled laborers, Farmers,* and *All others*); Persons who *can read;* Persons who *can write;* and Persons who *can speak English.*

The *age* classification is a faulty one, and does not lend itself readily to statistical purposes, such as the calculation of death-rates, for the reason that mortality returns are never given by such age groups as are found in this report. Obviously, several of the terms used in the classification are useless for any practical purpose without definitions, which are nowhere given. For example, we do not know what is meant by "family." The term needs to be carefully defined when used for statistical purposes. Under *occupation* the classification adopted is useless with the possible exception of "farmers." What is meant by "unskilled" and "skilled" laborers? Females are apparently included, so far as they are in gainful occupations, but the minimum age is not stated.

The census report of New Jersey for 1905 is principally useful as giving the population of the various localities with distinction of sex and color. Some of the other classifications, if properly defined, might have served a limited purpose, but, when tabulated without definition of terms, they are very likely to be misleading.

The volume is commendable as a useful and convenient summary of the population of New Jersey from the earliest reliable records to date. Other States, notably New York, could profit by the example of New Jersey in this respect. At a very considerable expense the State of New York made an enumeration of its population in 1905, but, so far as we know, the returns have not been officially published, and the only knowledge of the results which is available is in the official reports made public through the press. This is a sad commentary upon the intelligence of the legislators of the most populous and wealthy State of the Union.

F. S. C.

AMERICAN
STATISTICAL ASSOCIATION.

NEW SERIES, No. 80 DECEMBER, 1907.

THE OUTLOOK FOR A GENERAL SYSTEM OF REGISTRATION OF VITAL STATISTICS IN THE UNITED STATES.*

By Cressy L. Wilbur, M.D., Chief Statistician, Bureau of the Census, Washington.

With special design I have selected the same title as that of my paper before the twenty-third annual meeting of the American Public Health Association at Denver in 1895. It is well for us to take account of stock and sum up what actual progress has been made in the registration of vital statistics during the past twelve years. The Denver paper, moreover, was suggested by the "Report on Plans for Complete and Authentic Records of Deaths and the Causes of Deaths in the United States," which was presented by Dr. Elisha Harris at the fifth annual meeting of the Association at Chicago in 1877, so that we have in effect a thirty years' retrospect of American vital statistics in the three papers. How many of our anticipations have come true, and what reasonable hopes may we entertain for the future of registration in this country?

Dr. Harris said in 1877:—

"Before the national census of 1880 is commenced, all of the States ought to have a good system of vital statistics organized and in harmonious operation, contributing comparable and numerically complete results. . . . Another decade of neglect to adopt an effectual system of registration in the United States would be greatly to the discredit of the intelligence and public spirit of American citizens."

It is thirty years since he spoke, and I invite your attention to the chart showing the condition of State registration in the United States in 1907, together with the progress made since 1895. The registration area for deaths has shown some advancement, although a large part of the country, including practically the entire South and also such populous States as Ohio and Illinois, is still unrepresented. The registration area for births consists of a few interrogation points only, distributed where the "prospects" for future results seem most promising.

*Read before the American Public Health Association, Atlantic City, Oct. 1, 1907.

I shall take up in the same order the points made in my paper of 1895, and endeavor to show how later experience has sustained or discredited my assertions.

Favorable Indications.

1. Not one of the States having accurate systems of registration at the beginning of the period has discontinued it.

We have lost one State (Delaware) from the registration area of 1890, and two States, after passing effective laws requiring burial permits (Illinois in 1901 and Iowa in 1904), have repealed them and gone back to the primitive gold-brick methods of expecting complete returns to be made by undertakers (Iowa) or physicians (Illinois) without the absolutely necessary requirement of a burial permit issued by a local registrar who is responsible for the complete and prompt registration of all deaths in his district. The people of these States are in the same condition as a man who buys a device for "perpetual motion," expecting to run his factory thereby: the means are not adequate to the end proposed; namely, the regular and complete registration of births and deaths for important legal and sanitary purposes.

As to Delaware, probably this State does not furnish an actual exception to the statement. It is my impression that the registration in 1890 was just as poor as in 1900,—there has been no change in the law,—and that the State was admitted in 1890 on account of exceptionally defective enumerators' returns for Delaware in that year. At present there seems to be absolutely no encouragement for better things in this State. I know of no State in which registration could so readily be made effective in which the prospect is so utterly hopeless.

2. Three States, Maine, New Hampshire, and New York, have been added to the registration column.

They have stuck, and, as you know, we have added Michigan, Indiana, and, during the past year, California, Colorado, Maryland, Pennsylvania, and South Dakota. And more are coming, I trust, in the immediate future. Nebraska and Utah have laws whose effective enforcement should bring them into line. Comprehensive laws have been passed during the present year in Minnesota, Montana, North Dakota (no appropriation as yet), Oregon, Washington, and Wisconsin, whose results will soon be known. Bills will be introduced in Ohio, Kentucky, and Virginia in 1908, and in Illinois, Kansas, and perhaps other States in 1909, so that we may have a number of accessions to the registration area before 1910, the year of the approaching decennial census.

3. The first indication of co-operation among the registrars of American States was signalized by the agreement of the registrars of New England,

made at the last meeting [1894] of this Association, to publish a summary of the statistics of the six States.

This valuable summary was published, but I believe that the co-operation has lapsed since the death of Dr. Abbott. Its place is taken by the wider union of all of the registration officials of the United States in the Section of Vital Statistics which is being organized at this meeting of the American Public Health Association, and by the annual reports of Mortality Statistics now published by the Bureau of the Census.

4. Municipal vital statistics have advanced more rapidly than State registration in general, and for many parts of the United States the data collected by cities under purely local regulations afford the only exact information obtainable.

This is still true for the entire South and for many other parts of the country. I do not think it is true, however, that municipal registration has continued to advance as rapidly as State registration during the past twelve years. No new registration cities have been added since 1900, and we have even lost the few registration cities in Iowa on account of the interference of the pernicious State law of 1906 with the requirement of compulsory burial permits. The returns from some Illinois cities are very unsatisfactory for a similar reason. While cities should secure more efficient registration of births and deaths than rural districts, their registration reports are of very unequal value. Some cities have not even yet adopted the International Classification of Causes of Death, whose general use was recommended by the American Public Health Association in 1897, preferring the use of unique systems of home manufacture of alleged superior value. The importance of uniformity, even with concession of personal preferences in matters of minor importance, does not appear to be realized by them. This can best be corrected by the opportunity of meeting in a national organization with other State and city registration officials, and with the feeling that, as we are working together for the advancement of the vital statistics of our common country, individual and personal differences should be forgotten in the adoption of methods that will afford uniform and fully comparable results. The Section of Vital Statistics in this Association can accomplish much in this direction, and affords the first opportunity for the meeting together on equal terms of State and city officials.

5. The United States government has undertaken work that, if continued, will have a salutary effect upon the isolated systems of registration now in operation. This work consists: (1) of the collection of data relating to sanitary climatology by the Weather Bureau of the United States Department of Agriculture; and (2) the employment of better methods for the collection and study of vital statistics by the Vital Statistics Division of the Census Bureau under the direction of Dr. Billings.

The work of the Weather Bureau was soon discontinued. That of the Bureau of the Census has been actively conducted since 1900, and especially since its establishment upon a permanent basis.

Unfavorable Indications.

1. The difficulties under which American vital statistics will long labor from the sparse distribution of the population as a whole will be dwelt upon in the present article as the most obvious and the most irremediable reasons for our failure as a nation to possess a system at all comparable with those of European countries. We cannot expect accurate registration in any except our most densely settled States for many years.

I still believe that lack of sufficient density of population is one of the most obvious reasons for failure of the extension of adequate registration methods in the United States, and shall further discuss the matter in the course of this paper.

2. None of the States having imperfect systems of registration has made any material improvement in accuracy during the past fifteen years [ending in 1895], although in several (*e.g.*, Ohio, Illinois, Indiana, Michigan) the population is dense enough to maintain an efficient system. One State, Tennessee, adopted a registration law in 1881, and repealed it in 1883, after an experience of twenty months.

The situation is much more encouraging, as shown by the list of new registration States under the head of "Favorable Indications." Indiana and Michigan were admitted in 1900 (Michigan for the census year 1899–1900). Illinois has tried and failed, and, as in all such cases, the outlook is less favorable than if no effort had been made. For this reason the prospect for securing adequate legislation in Ohio in 1908 ought to be excellent. No change has been made in the present worthless system since 1869, and the opportunity is afforded of putting in a thoroughly modern and effective system without interference by recent abortive legislation. There is no reason why Ohio should not possess as excellent registration methods as Pennsylvania, and the alleged "vital statistics" of Ohio cease to be a laughing-stock, as at present, collected, as they are, by the antiquated and thoroughly discredited method of enumeration, and compiled (causes of death, mind you!) by county judges of probate.

3. The most serious blow that the advancement of vital statistics has received was the failure of the great State of Pennsylvania to adopt a modern registration system, instead of a miserable makeshift, when the question came before her legislature in 1893. Half a loaf is not always better than no bread, when it is a question of vital statistics. Imperfect statistics may be far worse and more misleading than none at all, and it

EXTENSION OF THE REGISTRATION AREA (STATES) FOR DEATHS AND BIRTHS: 1895 TO 1907

REGISTRATION AREA FOR DEATHS

REGISTRATION AREA FOR BIRTHS

has been the experience of States with imperfect systems of registration, like Michigan [at that time, 1895], that the very existence of any system at all acts as an obstacle to the introduction of a better one, and thus retards the coming of efficient registration.

Full amends have been made by Pennsylvania for this "most serious blow" by the adoption in 1905 of a most complete and efficient registration law, whose enforcement warranted her admission to the registration area in 1906, and which may well be taken as a model for all States possessing resources adequate for as thorough registration. Instead of being the "most serious blow," as in 1893, her action in 1905 is the greatest encouragement and the most substantial assurance for the ultimate success of proper registration methods in the United States that has yet been afforded in the entire history of American registration. If a great State, with the utmost diversity of population and conditions of life, can, by the adoption of proper methods, change from a non-registration to a registration State in a single year, and that, too, after fifty years and more of absolute failure under imperfect laws, it is the best evidence that we are upon the right track; that the essential principles of registration recommended by the American Public Health Association and by the Bureau of the Census are *right* and will bring *results*.

4. There are indifference and lack of enthusiasm on the part of many public health officers on the subject of vital statistics.

This feeling still exists, but I believe that it will be one of the functions of our new organization of registration officials to diminish it. Some health officers are tired of chasing the "rainbow gold" of elusive data which they attempt to collect under necessarily defective laws. The importance of vital statistics as the fundamental basis of public health work should not be lost sight of, and while it is well to have a special Section, such as we propose to organize at this meeting, for the technical discussions, there should be at least one general paper on vital statistics read in the general session at each annual meeting of the American Public Health Association, and the members of the Association who may not be members of the Section should feel that we are merely their agents in our special work, and that we can accomplish little without the constant backing of their interest and support.

Influence of Density of Population on Accurate Registration.

Density of population is admittedly a very important factor in the practical collection of vital statistics, so much so that one might almost say that the page of the Compendium of the Eleventh Census exhibiting the changes in the density of population of the States of the Union, ac-

cording to successive censuses, holds within itself the history of the past, as well as the prophecy of the future, of vital statistics in this country.

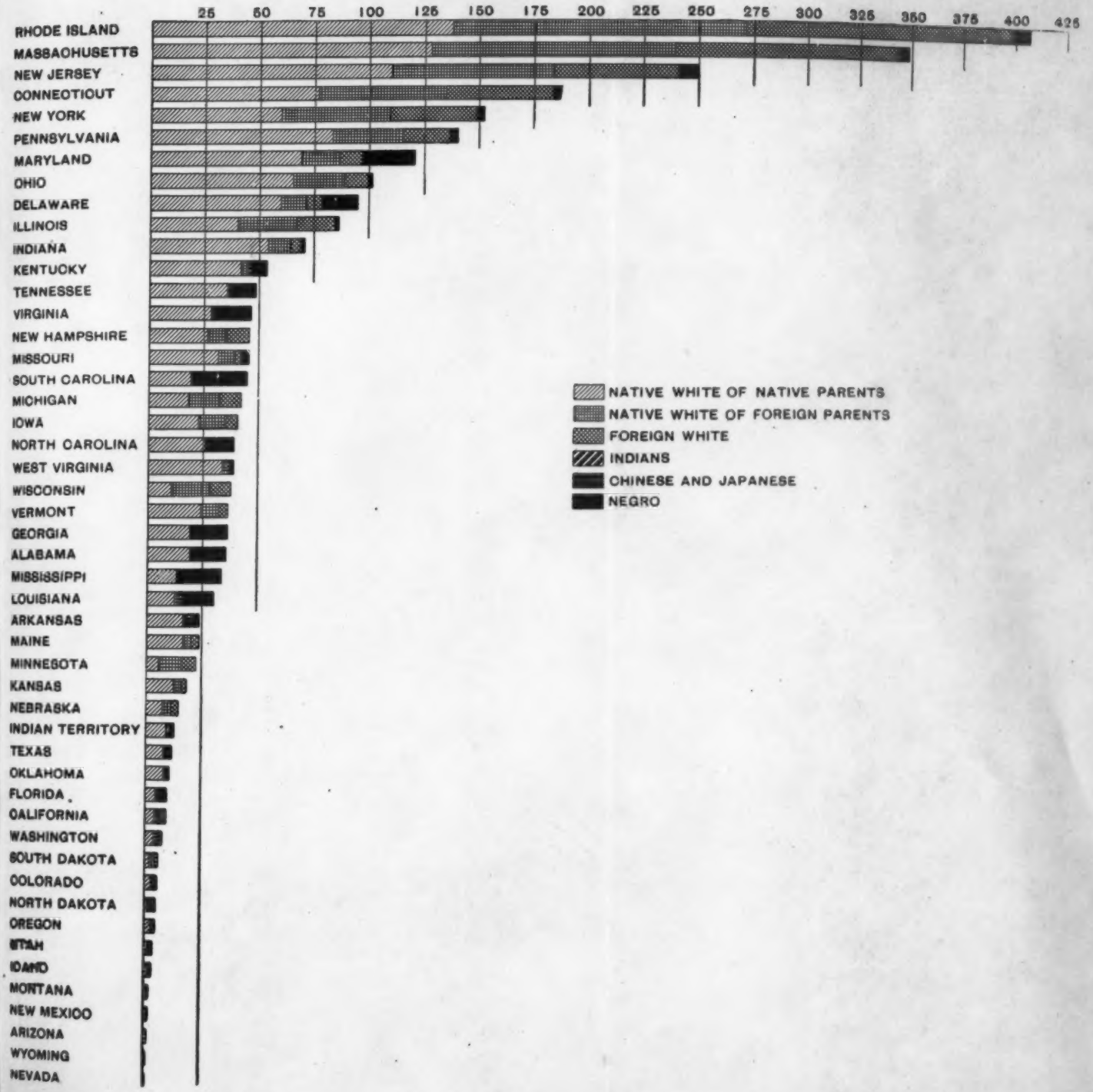
This remark is, in general, true. It is especially true of all that portion of the country in which the registration of vital statistics has made any progress whatever. But density of population is not the only important factor, and many elements are interwoven into the problem, so that it is difficult to demonstrate the relation of cause and effect in all cases. The density of population of each State, with respect to its constitution by nativity, parent nativity, and color, is shown in the accompanying diagram based upon the enumeration of the Twelfth Census.

The relation of density of population and certain other conditions to the development of effective registration of deaths may be seen in the following series of exhibits (1 to 17). The data are usually for the year 1900, although some later figures are given for manufactures (1905) and property per capita (1904) in order to show the tendency of progress. Registration States in 1907 are indicated by bold-face type. Years in parentheses following State abbreviations show dates of enactment of past laws or time when the State authorities expect to introduce legislation, which, it is *hoped*, may bring the States in question into the registration area. Several excellent laws enacted in 1907 have not yet been practically tested. Years in brackets (Illinois, Iowa) show dates of enactment of laws requiring burial permits, and which would probably have brought those States into the registration area by the present time if they had not been repealed. In the case of Delaware the bracketed year is the last for which it was accepted as a registration State. I shall not attempt to discuss the several exhibits in detail, but some features may be noted:

(1) With the addition of Pennsylvania and Maryland to the list of registration States in 1906, we have an unbroken series of the eight States with greatest density of population in the registration column. There should be twelve if the promising movement in Ohio bears fruit next year, the determination of the State Board of Health of Illinois to redeem the unfortunate action of 1903 succeeds, and if Delaware can be awakened from apathy to again become a registration State. Some of the new registration States are of very sparse population (California, South Dakota, Colorado), which implies great difficulty in securing complete registration. In two of these (California, Colorado) this is to some degree offset by high concentration of city population, as shown by the next exhibit.

(2) A closer relation is shown in the proportion of urban population (places over 8,000 in 1900). Eleven of the sixteen State registration areas (counting the District of Columbia among them) were above the average in percentage of urban population. Many Southern States of considerable density of population are low in this list. Illinois, Delaware,

PERSONS PER SQUARE MILE: 1900



and Ohio are the only non-registration States above the mean in this respect.

(3) Manufactures, like urban concentration, are related to density of population. Eleven registration States of the sixteen are above the average. Montana and Wisconsin passed comprehensive laws in 1907. Illinois, Delaware, and Ohio are again the delinquent members of the group. For very sparsely populated areas, like Arizona, no indications can be drawn.

(4) (5) The figures in these exhibits are somewhat more pertinent than those of (3), as they exclude neighborhood and mechanical industries, and hence would seem to be more closely related to urban aggregation. The movement from 1900 to 1905 may be noted. Washington is above the average in the latter year; a registration law was passed in 1907 and is now under test. Delaware shows a decline in rank.

(6) A generally inverse relation is shown in this table, the States least dependent upon agriculture having the best registration. Reasons for the failure of effective registration in Ohio and Illinois are suggested, but Delaware is closer to the registration States in this respect. The apparently exceptional position of South Dakota is worthy of note. Farming means distance to be overcome, lack of facilities of communication, and hence accurate registration is necessarily more difficult and should be especially favored in order to maintain the same standard of efficiency as can readily be effected in villages or cities; rural free delivery should have a great and most beneficial effect in promoting the extension of registration.

(7) An inverse relation is shown for the proportion of colored population. Only two registration areas are above the average in this respect, and of these Maryland was not admitted until 1906, and the District of Columbia is coextensive with the city of Washington and its registration laws are directly enacted by Congress. So far there has been practically no exception to the rule that effective registration of vital statistics cannot be conducted in a State having a very large proportion of colored population. Of course, this rule, or rather this experience, must find its exceptions if we are ever to have truly national vital statistics. Attempts will be made to enact legislation for this purpose in Kentucky and Virginia in 1908. Both of these States had systems of vital statistics before the Civil War which were fully abreast of the knowledge of the times; and, should their efforts succeed next year, it will throw an atmosphere of hope about the movement throughout the entire South which is now almost entirely wanting.

(8) Eleven of the sixteen registration areas have a proportion of foreign white persons higher than the average, and, conversely, the greater the percentage of native white Americans, the less the probability of

effective registration laws. Much of this may be coincidence, depending upon the different areas of distribution of immigration and the colored population of the South, but undoubtedly a person who had learned the importance of the registration of births and deaths by experience in his home country, as in England, Germany, Italy, or Sweden, would more intelligently support the enactment and administration of such legislation than a native American who was entirely ignorant of the subject and unaccustomed to the orderly conduct of vital records.

(9) (10) Wealth, in itself, does not seem to have a very close connection. The States at the bottom of the list in this respect all have a large colored population.

(11) Illiteracy is very important, sustaining an inverse relation to the desire and possibility of registration. But the States at the top of the list (least illiterate) have not as yet accomplished the best results.

(12) Not a single State having more than the average amount of native white illiteracy has been accepted in the registration area, except Delaware in 1890 (rejected in 1900). Not only the proportion of colored population, but the large numbers of illiterate whites, will make the attempts at registration in Virginia and Kentucky most difficult. For which reason they should receive the greater credit when they succeed, as they must at last!

(13) Foreign white illiteracy seems rather to march with effective registration, a showing due to the massing of uneducated immigrants in cities of Eastern States having good registration laws.

(14) As regards colored illiterates, the registration States are grouped in an inverse relation. In South Dakota the colored illiterates are chiefly Indians.

(15) Facility of communication by rail is of advantage to registration. Of two States with average density of population, that one with the higher mileage per 1,000 inhabitants should surpass. At the extremes of density of population, sparsely settled States, with large through mileage as compared with population, do not afford the facilities of congested areas with less proportional length of railroad.

(16) A similar relation exists as regards post-offices per 1,000 inhabitants, although the extension of rural free delivery since 1900 makes this of less importance than heretofore.

(17) Publications per 10,000 inhabitants do not show any well-marked relations, except between similarly situated States. The wide sphere of circulation of the large city papers renders comparison difficult. In a general way, publications and literacy should promote registration, and the State averages of circulation, especially of country weeklies, may be of importance in considering the establishment of a checking system, based upon newspaper reports, for the accuracy of returns.

(1) Persons per Square Mile, 1900.		(2) Per Cent. in Cities over 8,000, 1900.		(3) Manufactures per Capita, 1900,	
D.C.	4,645.3	**D.C.**	100.0	**R.I.**	$430
R.I.	407.0	**R.I.**	81.2	**Conn.**	388
Mass.	348.9	**Mass.**	76.0	**Mass.**	369
N.J.	250.3	**N.Y.**	68.5	**N.J.**	325
Conn.	187.5	**N.J.**	61.2	**N.Y.**	300
N.Y.	152.6	**Conn.**	53.2	**Pa.**	291
Pa.	140.1	Ill. ['01]	47.1	**N.H.**	288
Md.	120.5	**Md.**	46.9	Ill. ['01]	261
Ohio ('08?)	102.0	**Pa.**	45.5	Mont. ('07?)	247
Del. ['90]	94.3	**Cal.**	43.7	Del. ['90]	246
Ill. ['01]	86.1	Del. ['90]	41.4	**Cal.**	204
Ind.	70.1	**N.H.**	38.6	**Md.**	204
Ky. ('08?)	53.7	Ohio ('08?)	38.5	Ohio ('08?)	200
Tenn.	48.4	**Colo.**	38.1	**Colo.**	191
Va. ('08?)	46.2			**Me.**	183
N.H.	45.7	U.S.	32.9	Wis. ('07?)	175
Mo.	45.2			Ariz.	173
S.C.	44.4	Wash. ('07?)	31.9		
Mich.	42.2	**Mich.**	30.9	U.S.	171
Iowa ['04]	40.2	Mo.	30.8		
N.C.	39.0	Wis. ('07?)	30.7	**D.C.**	171
W. Va.	38.9	Mont. ('07?)	27.0	Wash. ('07?)	170
Wis. ('07?)	38.0	Minn. ('07?)	26.8	Vt.	168
Vt.	37.6	Utah ('05?)	25.2	Minn. ('07?)	151
Ga.	37.6	**Ind.**	24.2	**Ind.**	150
Ala.	35.5	Wyo.	24.1	**Mich.**	147
Miss.	33.5	Oreg. ('07?)	23.9	Nebr. ('05?)	135
La.	30.4	**Me.**	23.7	Mo.	124
		La.	22.8	Kans. ('09?)	117
U.S.	25.6	Ky. ('08?)	16.9	Oreg. ('07?)	112
		Iowa ['04]	16.8	La.	88
Ark.	24.7	Nebr. ('05?)	15.8	W. Va.	78
Me.	23.2	Fla.	15.0	Utah ('05?)	77
Minn. ('07?)	22.1	Va. ('08?)	14.7	Iowa ['04]	74
Kans. ('09?)	18.0	Kans. ('09?)	14.0	Ky. ('08?)	72
Nebr. ('05?)	13.9	Tenn.	13.4	Va. ('08?)	71
Ind. T.	12.6	Tex.	11.3	Fla.	70
Tex.	11.6	Vt.	11.2	Tenn.	54
Okla.	10.3	Ga.	11.0	N.C.	50
Fla.	9.7	W. Va.	7.7	Ga.	48
Cal.	9.5	S.C.	7.5	Wyo.	47
Wash. ('07?)	7.7	Ala.	7.3	Ala.	44
S. Dak.	5.2	Ark.	5.4	S.C.	44
Colo.	5.2	N.C.	5.1	Nev.	40
N. Dak. ('07?)	4.5	Okla.	5.0	Tex.	39
Oreg. ('07?)	4.4	N. Dak. ('07?)	3.0	Ark.	34
Utah ('05?)	3.4	Miss.	2.6	**S. Dak.**	32
Idaho	1.9	**S. Dak.**	2.6	N. Mex.	29
Mont. ('07?)	1.7	Ariz.	—	N. Dak. ('07?)	29
N. Mex.	1.6	Idaho	—	Miss.	26
Ariz.	1.1	Ind. T.	—	Idaho	25
Wyo.	.9	Nev.	—	Okla.	18
Nev.	.4	N. Mex.	—		

Note.—Registration States in bold-faced type.

(4) Factory Products per Capita, 1900.		(5) Factory Products per Capita, 1905.		(6) Agricultural Products per Capita, 1900.	
R.I.	$386	**R.I.**	$430	**D.C.**	$3
Conn.	347	**Conn.**	379	**Mass.**	15
Mass.	324	**Mass.**	379	**R.I.**	15
N.J.	294	**N.J.**	370	**N.J.**	23
Pa.	262	**N.Y.**	315	**Conn.**	31
N.H.	261	**Pa.**	291	**Pa.**	33
N.Y.	258	**N.H.**	290	**N.Y.**	34
Ill. ['01]	232	Ill. ['01]	270	Fla.	35
Del. ['90]	224	Mont. ('07?)	234	**Md.**	37
Mont. ('07?)	217	**Cal.**	230	Ga.	47
Ohio ('08?)	180	Ohio ('08?)	221	N.C.	47
Md.	178	Wash. ('07?)	221	Va. ('08?)	47
Cal.	173	Del. ['90]	215	W. Va.	47
Ariz.	166	Ariz.	205	Ala.	50
Colo.	165	**Me.**	203	Del. ['90]	50
Me.	163	**Md.**	195	S. C.	51
Wis. ('07?)	158	Wis. ('07?)	187	N. Mex.	52
				La.	53
U.S.	150	U.S.	182	**Me.**	53
				N.H.	53
Vt.	150	**Vt.**	181	Tenn.	53
Wash. ('07?)	137	**Colo.**	170	Ariz.	57
Ind.	134	**Mich.**	170	Ky. ('08?)	57
Mich.	132	Minn. ('07?)	159	Utah ('05?)	60
Minn. ('07?)	128	**Ind.**	149	Ark.	61
Nebr. ('05?)	122	Nebr. ('05?)	145	**Colo.**	61
Kans. ('09?)	108	Mo.	134	**Mich.**	61
Mo.	102	Kans. ('09?)	129		
Oreg. ('07?)	88	Utah ('05?)	128	U.S.	62
La.	81	La.	125		
W. Va.	70	Oreg. ('07?)	122	Ohio ('08?)	62
Fla.	65	W. Va.	95	Miss.	66
Utah ('05?)	65	Fla.	85	Wash. ('07?)	68
Iowa ['04]	60	Va. ('08?)	77	Mo.	71
D.C.	59	Iowa ['04]	73	Ill. ['01]	72
Ky. ('08?)	59	Nev.	73	Wis. ('07?)	76
Va. ('08?)	59	Ky. ('08?)	71	Tex.	79
Tenn.	46	N.C.	71	**Ind.**	81
N.C.	45	Tenn.	65	**Cal.**	89
Ga.	43	Ga.	64	Minn. ('07?)	93
S.C.	40	**D.C.**	62	Oreg. ('07?)	93
Ala.	39	Ala.	56	**Vt.**	98
Wyo.	35	S.C.	56	Idaho	113
Ark.	30	Idaho	46	Okla.	114
Nev.	30	Tex.	45	Mont. ('07?)	124
Tex.	30	Ark.	39	Wyo.	131
S. Dak.	24	Miss.	35	Kans. ('09?)	143
Miss.	22	Wyo.	35	Nebr. ('05?)	153
N Mex.	21	Okla.	31	Iowa ['04]	164
N. Dak. ('07?)	20	**S. Dak.**	29	Nev.	166
Idaho	19	N. Mex.	27	**S. Dak.**	172
Okla.	14	N. Dak. ('07?)	25	N. Dak. ('07?)	206
Ind. T.	7	Ind. T.	17		

NOTE.—Registration States in bold-faced type.

(7) Per Cent. of Colored Persons, 1900.	
N.H.	.2
Me.	.3
Vt.	.3
Wis. ('07?)	.5
Iowa ['04]	.6
Minn. ('07?)	.8
Mich.	.9
Nebr. ('05?)	.9
Mass.	1.3
N.Y.	1.5
Utah ('05?)	1.5
Conn.	1.8
Ill. ['01]	1.8
Colo.	2.0
R.I.	2.2
Ind.	2.3
N. Dak. ('07?)	2.3
Ohio ('08?)	2.3
Pa.	2.5
Kans. ('09?)	3.7
N.J.	3.8
Wyo.	3.8
Wash. ('07?)	4.2
Idaho	4.5
W. Va.	4.5
Oreg. ('07?)	4.6
Mo.	5.2
S. Dak.	5.2
Cal.	5.5
Mont. ('07?)	7.0
N. Mex.	7.7
Okla.	7.7
U.S.	12.2
Ky. ('08?)	13.3
Nev.	16.4
Del. ['90]	16.6
Md.	19.8
Tex.	20.4
Ind. T.	22.8
Tenn.	23.8
Ariz.	24.4
Ark.	28.0
D.C.	31.3
N.C.	33.3
Va. ('08?)	35.7
Fla.	43.7
Ala.	45.3
Ga.	46.7
La.	47.2
S.C.	58.4
Miss.	58.7

(8) Per Cent. of Foreign White Persons, 1900.	
N. Dak. ('07?)	36.1
R.I.	31.9
Mass.	30.3
Minn. ('07?)	29.1
Mont. ('07?)	27.6
Conn.	26.6
N.Y.	26.4
Wis. ('07?)	25.1
Nev.	24.2
Ariz.	24.1
N.J.	23.7
S. Dak.	23.2
Cal.	22.6
Mich.	22.5
N.H.	21.4
Wash. ('07?)	20.6
Ill. ['01]	20.4
Utah ('05?)	19.4
Wyo.	18.6
Colo.	17.1
Nebr. ('05?)	16.8
Pa.	16.0
U.S.	15.3
Idaho	14.2
Iowa ['04]	13.8
Oreg. ('07?)	13.7
Me.	13.4
Vt.	13.0
Ohio ('08?)	11.3
D.C.	10.2
Md.	9.8
Del. ['90]	8.9
Kans. ('09?)	8.9
N. Mex.	7.4
Mo.	7.3
Tex.	7.3
La.	7.1
Fla.	6.5
Ind.	5.8
Okla.	4.2
Ky. ('08?)	2.7
W. Va.	2.4
Ind. T.	1.6
Va. ('08?)	1.6
Ark.	1.5
Ala.	1.4
Miss.	1.2
Tenn.	1.1
Ga.	1.0
S.C.	1.0
N.C.	.3

(9) All Property per Capita, 1900.	
Nev.	$4502.82
D.C.	3332.18
Wyo.	3041.49
Mont. ('07?)	2522.91
Cal.	2167.31
Ariz.	2139.54
Colo.	1738.32
N.Y.	1720.39
Idaho	1708.42
N. Dak. ('07?)	1699.47
R.I.	1658.04
Mass.	1553.78
Oreg. ('07?)	1530.41
Nebr. ('05?)	1525.09
Iowa ['04]	1509.00
Wash. ('07?)	1508.58
Utah ('05?)	1491.08
Pa.	1478.10
N.J.	1451.21
Ill. ['01]	1446.94
Minn. ('07?)	1435.21
S. Dak.	1376.43
N. Mex.	1373.64
Conn.	1319.60
Kans. ('09?)	1317.92
Ohio ('08?)	1207.20
U.S.	1164.78
Okla.	1163.12
Wis. ('07?)	1162.54
N.H.	1147.13
Del. ['90]	1146.03
Md.	1108.86
Mich.	1096.37
Mo.	1044.38
Ind.	1035.78
Me.	982.24
Vt.	960.06
Ind. T.	888.31
Tex.	761.68
W. Va.	688.00
Fla.	673.06
Ky. ('08?)	635.78
Va. ('08?)	594.50
La.	590.00
Tenn.	473.46
Ark.	460.69
Ala.	423.63
Ga.	422.32
S.C.	362.36
N.C.	360.11
Miss.	359.44

Note.—Registration States in bold-faced type.

(10) All Property per Capita, 1904.		(11) Per Cent. of Illiterates (over 10 Years), 1900.		(12) Per Cent. of Native White Illiterates (over 10 Years), 1900.	
Nev.	$5214.00	Iowa ['04]	2.3	Wash. ('07?)	.5
D.C.	3490.63	Nebr. ('05?)	2.3	Mont. ('07?)	.6
Wyo.	3297.07	Kans. ('09)	2.9	**Nev.**	.6
Mont. ('07?)	2632.56	Utah ('05?)	3.1	**S. Dak.**	.6
Cal.	2582.32	Wash. ('07?)	3.1	Wyo.	.7
Ariz.	2238.94	Oreg. ('07?)	3.3	**Conn.**	.8
Colo.	2045.71	Ohio ('08?)	4.0	**D.C.**	.8
Oreg. ('07?)	1885.62	Wyo.	4.0	**Mass.**	.8
Nebr. ('05?)	1882.04	Minn. ('07?)	4.1	Minn. ('07?)	.8
N.Y.	1867.70	**Colo.**	4.2	Nebr. ('05?)	.8
Iowa ['04]	1828.26	Ill. ['01]	4.2	Oreg. ('07?)	.8
Wash. ('07?)	1805.60	**Mich.**	4.2	Utah ('05?)	.8
Idaho	1794.58	Idaho	4.6	Idaho	.9
N. Dak. ('07?)	1770.58	**Ind.**	4.6	N. Dak. ('07?)	.9
Minn. ('07?)	1728.73	Wis. ('07?)	4.7	**Cal.**	1.0
Pa.	1707.46	**Cal.**	4.8	Iowa ['04]	1.2
R.I.	1701.55	**S. Dak.**	5.0	**N.Y.**	1.2
Ill. ['01]	1689.12	**Me.**	5.1	Kans. ('09?)	1.3
Mass.	1672.25	**N.Y.**	5.5	Wis. ('07?)	1.3
Utah ('05?)	1609.07	Okla.	5.5	**N.H.**	1.5
N. Mex.	1587.33	N. Dak. ('07?)	5.6	**Mich.**	1.7
N.J.	1546.63	**Vt.**	5.8	**N.J.**	1.7
S. Dak.	1529.58	**Conn.**	5.9	**R.I.**	1.8
Kans. ('09?)	1467.75	**Mass.**	5.9	Ill. ['01]	2.1
Conn.	1453.47	**N.J.**	5.9	**Pa.**	2.3
Ohio ('08?)	1366.61	Mont. ('07?)	6.1	**Me.**	2.4
		Pa.	6.1	Ohio ('08?)	2.4
U.S.	1318.11	**N.H.**	6.2	Okla.	2.5
		Mo.	6.4	**Colo.**	2.7
Mich.	1297.39	**R.I.**	8.4	**Vt.**	2.9
Wis. ('07?)	1292.09	**D.C.**	8.6	**Ind.**	3.6
N.H.	1214.23			**Md.**	4.1
Md.	1212.78	U.S.	10.7		
Okla.	1208.52			U.S.	4.6
Del. ('90?)	1204.10	**Md.**	11.1		
Ind.	1173.73	W. Va.	11.4	Mo.	4.8
Mo.	1147.04	Del. ['90]	12.0	Del. ['90]	5.6
Me.	1095.79	Nev.	13.3	Tex.	6.1
Vt.	1035.05	Tex.	14.5	Ariz.	6.2
Ind. T.	962.69	Ky. ('08?)	16.5	Miss.	8.0
Tex.	840.65	Ind. T.	19.0	Fla.	8.6
W. Va.	809.87	Ark.	20.4	W. Va.	10.0
Fla.	729.14	Tenn.	20.7	Va. ('08?)	11.1
La.	694.24	Fla.	21.9	Ark.	11.6
Ky. ('08?)	675.11	Va. ('08?)	22.9	Ga.	11.9
Va. ('08?)	666.15	N.C.	28.7	Ky. ('08?)	12.8
Ark.	580.48	Ariz.	29.0	S.C.	13.6
Tenn.	520.40	Ga.	30.5	Ind. T.	14.0
Ala.	493.66	Miss.	32.0	Tenn.	14.2
Ga.	493.03	N. Mex.	33.2	Ala.	14.8
N.C.	420.16	Ala.	34.0	La.	17.3
Miss.	415.62	S.C.	35.9	N.C.	19.5
S.C.	413.74	La.	38.5	N. Mex.	29.4

Note.—Registration States in bold-faced type.

(13) Per Cent. of Foreign White Illiterates (over 10 Years), 1900.		(14) Per Cent. of Colored Illiterates (over 10 Years), 1900.		(15) Miles of Railroad per 1,000 Inhabitants, 1900.	
Oreg. ('07?)	4.1	Conn.	11.8	D.C.	.1
Wash. ('07?)	4.5	Mass.	12.4	R.I.	.5
Idaho	6.0	N.Y.	12.8	Mass.	.8
N.C.	6.1	R.I.	14.2	Conn.	1.1
Utah ('05?)	6.1	Vt.	15.0	N.Y.	1.1
S.C.	6.5	N.H.	15.2	Md.	1.2
S. Dak.	6.7	Pa.	15.3	N.J.	1.2
Nebr. ('05?)	6.8	Nebr. ('05?)	17.1	Ky. ('08?)	1.4
D.C.	7.0	N.J.	17.5	Pa.	1.6
Ga.	7.0	Ohio ('08?)	17.9	Tenn.	1.6
Mont. ('07?)	7.0	Ill. ['01]	18.2	Del. ['90]	1.9
Iowa ['04]	7.1	Colo.	20.0	Miss.	1.9
Nev.	7.5	Iowa ['04]	20.2	La.	2.0
N. Dak. ('07?)	7.8	Mich.	20.9	N.C.	2.0
Ark.	8.0	Ind.	22.6	Va. ('08?)	2.0
Colo.	8.1	Kans. ('09?)	22.7	Ohio ('08?)	2.1
Wyo.	8.2	D.C.	24.2	Okla.	2.1
Okla.	8.3	Me.	25.8	S.C.	2.1
Minn. ('07?)	8.4	Mo.	28.0	Mo.	2.2
Kans. ('09?)	8.5	Cal.	31.1	Ala.	2.3
Cal.	8.7	W. Va.	32.3	Ill. ['01]	2.3
Ill. ['01]	9 1	Md.	35.2	W. Va.	2.3
Ala.	9.3	Ind. T.	36.0		
Mo.	9.3	Wash. ('07?)	36.0	U.S.	2.5
Tenn.	9.7	Oreg. ('07?)	36.1		
Mich.	10.3	Okla.	36.3	Ark.	2.6
Miss.	10.7	Del. ['90]	38.1	Ga.	2.6
Ky. ('08?)	10.9	Tex.	38.2	Ind.	2.6
Va. ('08?)	10.9	Fla.	38.5	Me.	2.8
Ohio ('08?)	11.1	Wis. ('07?)	39.6	Vt.	2.9
Wis. ('07?)	11.1	Ky. ('08?)	40.1	N.H.	3.0
Ind.	11.4	Wyo.	41.1	Tex.	3.2
Fla.	11.6	Minn. ('07?)	41.2	Wis. ('07?)	3.2
		Tenn.	41.6	Ind. T.	3.4
U.S.	12.9	Ark.	43.0	Mich	3.4
				Cal.	3.9
Md.	13.4	U.S.	44.6	Minn. ('07?)	4.0
N.Y.	14 0			Iowa ['04]	4.1
N.J.	14.1	Va. ('08?)	44.6	Oreg. ('07?)	4.2
Mass.	14.6	N.C.	47.6	Nebr. ('05?)	5.3
Conn.	16.3	Mont. ('07?)	48.2	Utah ('05?)	5.6
Del. ['90]	18.3	Miss.	49.1	Wash. ('07?)	5.6
R.I.	18.7	S. Dak.	51.0	Kans. ('09?)	5.9
Ind. T.	19.0	Utah ('05?)	52.1	Fla.	6.3
Me.	19.4	Ga.	52.3	S. Dak.	7.1
Pa.	19.9	S.C.	52.8	Idaho	7.8
N.H.	20.5	Idaho	53.9	Colo.	8.4
Vt.	21.4	Ala.	57.4	N. Dak. ('07?)	8.5
W. Va.	21.5	N. Dak. ('07?)	59.2	N. Mex.	9.0
La.	28.6	La.	61.1	Ariz.	12.3
Tex.	30.3	Nev.	66.8	Mont. ('07?)	12.3
N. Mex.	34.8	N. Mex.	71.1	Wyo.	13.3
Ariz.	35.3	Ariz.	73.6	Nev.	21.3

Note.—Registration States in bold-faced type.

(16)

POST-OFFICES PER 1,000 INHABITANTS, 1900.

D.C.	.1
Mass.	.3
R.I.	.3
Ill. ['01]	.5
N.J.	.5
N.Y.	.5
Conn.	.6
Ohio ('08?)	.8
Pa.	.8
Ind.	.9
Iowa ['04]	.9
La.	.9
Mich.	.9
Wis. ('07?)	.9
U.S.	1.0
Del. ['90]	1.0
Md.	1.0
Minn. ('07?)	1.0
Mo.	1.0
Nebr. ('05?)	1.0
Tex.	1.0
Cal.	1.1
Kans. ('09?)	1.1
S.C.	1.1
Ga.	1.2
Utah ('05?)	1.2
Ind. T.	1.3
Miss.	1.3
Ala.	1.4
Colo.	1.4
Ky. ('08?)	1.4
N.H.	1.4
Ark.	1.5
Tenn.	1.5
N. Mex.	1.6
N.C.	1.6
Okla.	1.6
Wash. ('07?)	1.6
S. Dak.	1.7
Vt.	1.7
Ariz.	1.8
Me.	1.8
Va. ('08?)	1.9
Mont. ('07?)	2.0
N. Dak. ('07?)	2.0
W. Va.	2.0
Fla.	2.2
Oreg. ('07?)	2.2
Idaho	2.8
Wyo.	3.4
Nev.	4.4

(17)

PAPERS AND PERIODICALS PUBLISHED PER 10,000 INHABITANTS, 1900.

Nev.	8.5
S. Dak.	6.7
Colo.	6.1
Nebr. ('05?)	5.9
Oreg. ('07?)	5.0
Iowa ['04]	4.9
N. Dak. ('07?)	4.9
Cal.	4.8
Kans. ('09?)	4.8
Wyo	4.8
Idaho	4.5
Ill. ['01]	4.5
Ariz.	4.4
Wash. ('07?)	4.3
Mont. ('07?)	3.9
Minn. ('07?)	3.8
Ind.	3.5
Mo.	3.4
Mich.	3.3
Okla.	3.2
Wis. ('07?)	3.2
D.C.	3.1
Fla.	3.0
Ohio ('08?)	3.0
Utah ('05?)	2.9
U.S.	2.8
N. Mex.	2.8
N.Y.	2.8
Tex.	2.7
Me.	2.6
N.H.	2.6
Conn.	2.3
Del. ['90]	2.3
Pa.	2.3
Vt.	2.3
Ind T.	2.2
Mass.	2.2
N.J.	2.1
Ark.	2.0
W. Va.	2.0
Md.	1.8
Ga.	1.7
Ky. ('08?)	1.5
Tenn.	1.5
La.	1.4
Miss.	1.4
N.C.	1.4
R.I.	1.4
Va. ('08?)	1.4
Ala.	1.3
S. C.	1.0

NOTE.—Registration States in bold-faced type.

Limitations of Vital Registration.

Accepting density of population as a very important factor in registration, the condition of the United States may be compared with other countries by means of the following table:—

DENSITY OF POPULATION IN CERTAIN COUNTRIES.

Country.	Year.	Persons per Square Mile.
United States	1890	21
"	1900	26
"	1907	29
United Kingdom	1901	342
England and Wales	1901	558
Scotland	1901	147
Ireland	1901	138
British possessions:		
Ceylon	1901	141
Cape of Good Hope	1901	9
Orange River Colony	1901	8
Transvaal	1901	11
Dominion of Canada	1901	1
Manitoba	1901	3
New Brunswick	1901	12
Nova Scotia	1901	218
Ontario	1901	8
Quebec	1901	5
Newfoundland	1901	5
Jamaica	1901	152
British Guiana	1901	3
Australasia	1901	2
Australian Commonwealth	1901	1
New South Wales	1901	4
Victoria	1901	14
Queensland	1901	0.7
South Australia	1901	0.4
Western Australia	1901	0.2
Tasmania	1901	7
New Zealand	1901	8
Fiji Islands	1901	16
Austria-Hungary	1900	188
Austria	1900	226
Hungary	1900	154
Belgium	1900	589
Denmark	1901	160
France	1901	191
Germany	1900	270
Italy	1901	293
Japan	1903	317
Netherlands	1904	436
Norway	1900	18
Spain	1900	97
Sweden	1900	30
Switzerland	1900	208

While most registration countries are much more densely populated than the United States, the conditions in Australia and New Zealand would seem to be quite similar. In many cases, if the entirely uninhabited or extremely sparsely settled territory could be deducted, a matter affecting very few people, the remainder of the area would show a considerably higher density, and perhaps one quite practicable for registration purposes. On the whole, our experience since 1895 has seemed to show that a remarkably low nominal density might yet yield fairly effective results.

In my first paper I assumed an inferior limit of density of population of about forty persons per square mile, below which accurate registration would not be possible, or at least not practicable, under ordinary conditions. The limit that I should fix at present is somewhat below this. The superior limit above which registration comes of itself, through the mere necessities of crowded modern life, I should leave at the old figure of one hundred persons per square mile,—certainly until Ohio shall become a registration State.

In the prediction that I ventured to make as to the time when the United States would probably have a general system of registration of vital statistics, if dependent upon the natural progress of the individual States under conditions then existing, I set the date at about the close of the present century (1980). At that time, according to Professor Pritchett's estimate, the United States would have a population of 296,814,000, approximating 100 persons per square mile. But Hon. S. N. D. North, Director of the Census, in a recent article* in which he takes the declining birth-rate into consideration, estimates that the population of the United States will be only 252,206,305 in 1980, 281,714,443 in 1990, and 311,857,888 in 2000. This pushes the period some fifteen years further off, and warns us that we cannot sit down supinely if we expect to see general registration spontaneously accomplish itself.

Seriously, I see no occasion to materially revise the opinion that, "even under the most favorable circumstances, however, we can hardly expect this result to come about spontaneously before the middle of the twentieth century." Sometimes I think that the movement is proceeding with an enthusiasm that may clip ten years or so from this estimate, leaving us in 1930 or 1940 with a modern system of registration that will compare favorably with that which the Japanese possess to-day. Sometimes, especially when I consider our progress in the registration of births, I feel that I was far too sanguine, and that 1990 or 2025 will be nearer the time. Until at least one State in the Union has succeeded in registering practically all of its births, and until at least one State of the South, having a considerable colored population, has succeeded in

* *The Youth's Companion*, June 13, 1907.

registering practically all of its deaths, we shall have no basic material upon which to make reliable predictions. Only the time seems mighty slow a-coming, and it must add to the gayety of foreign nations to see us make such a tremendous long-drawn-out fuss about what is to them a very simple little administrative problem. They do not understand laws that are not obeyed.

Means for Hastening the Advent of Accurate Registration.

We should utilize, in the first place, the results of municipal registration of vital statistics in the United States.

This has been done by the Bureau of the Census, so far as any results were available permitting satisfactory use. Some returns from cities are most carelessly made, and it is doubtful whether certain cities now forming part of the registration area properly belong there. A general attempt will be made to improve the character of such returns and to secure more cities in non-registration States from which returns can be received. But municipal registration of vital statistics, without an underlying basis of State law, is at best an uncertain affair.

Another way in which the advent of general registration may be hastened is the prevention of retrograde action on the part of the States in relation to the subject of vital statistics and the securing of the adoption of a satisfactory registration law by those States that have advanced sufficiently in density of population to guarantee its successful administration. The essentials of modern registration should be clearly presented to the medical profession and the general public, so that the appalling ignorance that not infrequently appears when the subject comes up in State legislatures would be less in evidence.

The essential principles underlying laws for the registration of deaths have been worked out by the former Committee on Demography of this Association in conjunction with the Bureau of the Census, and forms of laws based thereon have been the foundation of most of the successful statutes enacted. Special pamphlets have been prepared by the Bureau of the Census for this purpose and widely distributed, and others are planned or in course of preparation. The list up to date is as follows:—

No. 71. (Circular) Registration of Deaths.
No. 100. Legislative Requirements for Registration of Vital Statistics.
No. 101. Practical Registration Methods.
No. 102. Relation of Physicians to Mortality Statistics.
No. 103. Medical Education in Vital Statistics.
No. 104. Registration of Births and Deaths. Drafts of laws.

No. 105. Statistical Treatment of Causes of Death.
No. 106. Extension of the Registration Area for Births and Deaths.
No. 107. Modes of Statement of Cause of Death and Duration of Illness.

There is, fortunately, a way by which the interest of this Association in the improvement of our State registration systems may be readily manifested and by which good results may probably be secured. The boards of commissioners appointed by many of the States to bring about, by voluntary State action, greater uniformity in the statute laws prevailing in the different States and Territories, are working exactly in the direction which any movement for a general registration system in this country must take. They have already recommended important legislation relating to marriage and divorce. Their hearty support of measures looking toward uniformity in the registration of births and deaths in the several States cannot be doubted. It only remains to exhibit fully the importance and essential requirements of such registration in order to enlist the services of this very influential organization in the cause of improved vital statistics, and I hope that the American Public Health Association will at this meeting appoint a committee to memorialize the boards of State commissioners, through their National Conference, to this effect.

So impressed was I at the time with the importance of doing this that I introduced the following resolution, which, however, failed to pass:—

"*Resolved*, That a committee of the American Public Health Association be appointed to present to the Boards of Commissioners appointed by certain States to promote greater uniformity of statute laws, the importance of uniformity in the methods of registration of births and deaths in the several States of the Union."

We have only lost some twelve years, however, by failure to take action at that time. You will be glad to know that the matter of enlisting the aid of the Commissioners on Uniform State Laws was taken up by the Director of the Census last year, and that their recent conference held at Portland, Me., on August 22, 1907, cordially adopted a resolution providing for a committee to enter upon the drafting of uniform laws for the registration of births and deaths. A similar recommendation has been made in the American Bar Association.

Again, the change in the methods of the United States Census relative to the collection and study of vital statistics should be encouraged and extended. The enumeration or ordinary census method has long been a recognized failure in its application to vital statistics. It would be well if it could be entirely discarded in the collection of the vital data for

the census of 1900, and be replaced, as far as possible, by approved methods.

I have great pleasure in announcing, by the express authority of the Director of the Census, and this constitutes the first public announcement that has been made, that the method of attempting to *enumerate* vital statistics has been omitted entirely from the plans now preparing for the Thirteenth Census to be taken in 1910. We have thrown away our crutches, and, if we cannot walk, we must fall. We shall depend exclusively hereafter upon *registration* returns, and shall not endeavor to supplement them or replace them by enumerators' schedules. We shall not even attempt to use enumerators' returns to check up the accuracy of registration, and thereby to determine whether a State is or is not entitled to admission to the registration area. During the past year we have tested other methods, and, as they have proved, much more satisfactory ones, for this purpose. We shall not fall. We shall cease to publish worthless, or nearly worthless, data for certain areas, and the immediate result should be a greatly increased determination among the various non-registration States to raise their standard of efficiency by the adoption and enforcement of proper laws, so that they may not be *unrepresented* in the national vital statistics.

For many reasons it is desirable that there should be a permanent census establishment both on grounds of economy and improved service. The machinery of a great census should not be entirely dismantled when the period of its immediate activity is over, but it should be reduced to a peace footing for a time, during which extended investigations and the preparation for sudden activity could go on quietly and economically. Then, when the date of the census arrives, there would be a staff of trained experts to serve as officers in the army which is raised so rapidly, goes into action with such intensity, and which is disbanded about the time that its duties are fully learned under the present system.

All of this has now come to pass, and, in my presence here as the representative of the permanent Bureau of the Census, I need not assure you of its earnest desire to co-operate with this Association, with the new Section of Vital Statistics, whose formation I had the honor to recommend to you last year as essential to the progress of American vital statistics, and with the individual registration officials, both State and municipal, who are charged with the duty of collecting the original returns.

What have we Accomplished since 1895?

Not very much, when we consider what still lies before us to do before we shall have, as Doctor Harris hoped in 1877 we should soon have, a system of registration of vital statistics worthy of a great nation. Let

us re-read his words and consider whether he set the mark too high and beyond the bounds of reasonable achievement:—

Before the national census of 1880 is commenced, all of the States ought to have a good system of vital statistics organized and in harmonious operation, contributing comparable and numerically complete results. . . . ANOTHER DECADE OF NEGLECT TO ADOPT AN EFFECTUAL SYSTEM OF REGISTRATION IN THE UNITED STATES WOULD BE GREATLY TO THE DISCREDIT OF THE INTELLIGENCE AND PUBLIC SPIRIT OF AMERICAN CITIZENS.

Was it ready by 1880? No; nor by 1890; nor by 1900; nor will it be ready by 1910; nor does it seem likely to be by 1920; nor, at the rate at which we are progressing, with not a single State or city in the Union yet definitely accepted as a nucleus for the registration area for births, does the prospect seem certain for 1930, or 1940, or even 1950. We must make a beginning of some kind before we can even predict the probable time in the remote future when the United States shall take an honorable place in the assembly of nations which believe that the registration of the vital events of their citizens is a necessary function of government and indispensable to an enlightened and progressive administration of national affairs.

We have accomplished some small things—if only they would stay accomplished while we contemplate them. You know that the registration area for deaths has been considerably extended since 1900; yet even now there is a cancer at work in the systems of several States in the form of permitting undertakers to issue burial "permits," which, unless removed, will destroy their efficiency. A standard certificate of death has been prepared by the American Public Health Association and the Bureau of the Census, and extensively employed with resulting advantage in causing uniformity of the data collected; yet many States and cities have continued to employ their old forms, whose variety is multitudinous, and, most unfortunate of all, offices that have "adopted" the standard blank have not hesitated to materially change it without reference to or consultation with any other offices, so that the information obtained is frequently entirely different from what it purports to be when returned to the Bureau of the Census upon the actual standard blank. This condition you can examine in the special pamphlet * prepared for presentation to the registration officials of the United States at their first meeting as a Section of this Association, with the hope that a clear understanding of the dangers resulting from arbitrary changes in what should

* Census pamphlet No. 107, Modes of Statement of Cause of Death and Duration of Illness upon Certificates of Death.

be a uniform national form will result in closer adherence to the accepted standard.

The most important action that the American Public Health Association has ever taken in regard to vital statistics was when it finally adopted at Ottawa in 1898 the resolutions introduced by the Committee on Demography at Philadelphia in 1897 in regard to the International Classification of Causes of Death (then known as the Bertillon system). While the delay of a year cost it the honor of priority, the system having been first indorsed by the Conference of State and Provincial Boards of Health at Detroit in 1897, the resolutions finally passed by this Association gave the final impetus which determined the general acceptance of this system throughout the entire western hemisphere, as well as in certain countries of Europe and Africa, in Japan, and—I need not tell you with what pleasure and delight I make this announcement—the new Commonwealth of Australia. I hold in my hand a pamphlet recently published by the Commonwealth Bureau of Census and Statistics of Australia, Hon. G. H. Knibbs, F.S.S., etc., Commonwealth Statistician, from which I make the following extracts:—

"The adoption of a classification not only more closely conforming to recent advances in nosology, but one which also renders possible a much wider field of comparison than any existing index in actual use in this country, is an essential in attaining any marked improvement in the Statistics of Disease and Death in Australia.

"The Nomenclature of Diseases and Causes of Death, as revised and adopted in the year 1900 by the International Commission [the original proposition for which was made by the American Public Health Association] charged with a revision of the earlier nosological nomenclature, provides a classification which, better than all others, meets the requirements indicated.

"At a Statistical Conference, in which every State of the Commonwealth, the Commonwealth itself, and New Zealand were represented, the adoption of this nomenclature was unanimously approved, and, in order to facilitate its application, the translation of the work above referred to was undertaken in the Commonwealth Bureau of Census and Statistics, and is now published for general information. . . .

"The value of a comprehensive nosological nomenclature or index, by means of which diseases and causes of death may be so classified as to facilitate comparisons of the vital statistics of many countries, is sufficiently obvious to need but mention. This value depends upon two elements, namely:—

"(1) The range of its acceptance; and

"(2) Its scientific accuracy.

"In regard to the former it may be observed that the adoption of the

classification of Dr. Jacques Bertillon, the distinguished chief of the Statistical Department of the City of Paris, will render possible a wider range of comparison than any other existing index. This alone gives it a large claim to consideration.

"With respect to the latter element it will be sufficient to say that, notwithstanding any scientific limitations by which it may be characterized, from the standpoint of the nosology of to-day, the 1900 edition of the Bertillon Classification will fulfil its object up to the time when it is proposed to revise it (viz., 1910) sufficiently for all practical purposes, and with the advantage already referred to.

"At a recent Conference of Statisticians, at which the Commonwealth, New Zealand, and each State of Australia was represented, it was decided, after careful consideration, to recommend this classification for adoption. In making this recommendation, the Statistical Conference was guided mainly by a recognition of the signal advantages of a classification which made possible a wide comparison of statistical results. It was also considerably influenced by the fact that a special statistical committee of the Australasian Medical Congress for 1908, through its convener, Dr. W. Perrin Norris, expressed the view that the question of adopting the Bertillon classification was worthy of serious examination.

"The considerations which, in other countries, have led to the adoption of the Bertillon classification in European and American countries are so ably set forth in the introduction to the revised edition of 1900 that not only is a translation given in full, but reference is also made to the opinions of the committee which secured its adoption in the United States, Canada, and Mexico. . . .

"As an evidence of the appreciation of the system in America, to which reference has already been made, the following extracts from the proceedings of the American Public Health Association are considered worthy of reproduction *in extenso:* [Here follow your resolutions of 1898.]

"From the foregoing pages it will be seen that the classification adopted by the International Commission has been accepted in many countries. What makes it of particular interest to Australia, however, seeing that comparisons with American conditions are of the greatest value to us, is the fact of its almost universal adoption in America. The authors of the classification do not lay claim to perfect scientific accuracy. As they very properly say, such accuracy is impossible of attainment. The provision of a decennial revision makes it at least certain that the classification will be kept sufficiently abreast of the progress of medical science for all practical purposes. This fact, the suggestion of the committee of the Australasian Medical Congress for 1908, and the fact that the Bertillon classification gives the widest range for comparison of vital statistics, led the Conference of Australasian Statisticians, assembled

in Melbourne in November and December, 1906, to decide upon its introduction, and to remit to their president, the Commonwealth Statistician, the preparation of an English edition for use in the Commonwealth of Australia and in New Zealand.

"The translation following hereinafter has aimed at being purely literal, and while the 'Nomenclature of Diseases drawn up by a Joint Committee appointed by the Royal College of Physicians of London, 1896,' was not overlooked, and some slight use was made thereof, it could not be allowed to influence the classification without defeating its primary object."

I hope this action will be as inexpressibly gratifying to you as it is to me, giving fresh encouragement to the movement, which now *shall* succeed, for universally comparable statistics of causes of death. Your action in 1898 suggested the International Commission; it determined the acceptance of the system by some wavering European countries and, I believe, by Japan; it secured Costa Rica, Brazil, and perhaps other countries of Central and South America. It caused the United States Census Office, upon the recommendation of my predecessor, Mr. William A. King, to adopt the International Classification for the first year of the annual Mortality Statistics, beginning in 1900; and every registration State in the Union and *nearly all* of the registration cities have followed suit. But it is an unfortunate fact that many offices nominally using or attempting to use the International Classification take liberties with it, both with respect to actual form and also as regards the inclusions of titles, so that the statistical results are sometimes far from comparable. It is better not to use it at all than to partly employ it and induce statisticians to make use of figures that are not properly compiled thereunder.

Are you satisfied with Progress?

Important as they are, questions of forms of statistics are comparatively trivial beside the question of whether we shall have any vital statistics at all for the United States as a Nation. The whole Nation, not a little stretch of it here and there. Whether the births and deaths of all Americans shall be *registered*, as are those of human beings in all civilized communities except the United States, or whether the United States Commissioner of Pensions must rely, for example, as he was actually compelled to do in a certain case, for evidence as to the date of birth of the child of a deceased soldier, required for pension allowance, upon the date of birth of the foal of a celebrated race horse: the animal's birth was recorded, while the child's was not! Do you believe in the necessity of such registration, not merely for what sanitary uses you

make of it, but as a matter of self-respect and legal importance to our people? *Do* you believe in it?

I presume I could get the unqualified indorsement of every member of this Association as to the indispensable importance of reliable vital statistics for sanitary purposes. I presume you would assent to the following resolution, which is substantially that adopted by the Associated Health Authorities and Sanitarians of Pennsylvania in 1904, the year before the passage of the present effective registration law of that State. The provisions of general application are as follows:—

"*Whereas* the accurate registration of vital statistics is an indispensable requisite of an efficient modern public health service; and

"*Whereas* the Congress of the United States, by joint resolution, has called upon the authorities of the various States to co-operate in establishing such registration,—therefore be it

... "***Resolved,*** **That the achievement of the registration [of all births and] of all deaths, with their causes, immediately after their occurrence, and the prompt return of certificates from local registrars to the central bureau of vital statistics, thereby giving the sanitary authorities of the State timely information of the exact prevalence and distribution of disease, IS THE MOST IMPORTANT OF ALL SANITARY MEASURES, AND SHOULD BE UNREMITTINGLY URGED UNTIL SUCCESSFULLY CARRIED OUT IN EVERY STATE OF THE UNION."**

Then why not do it?

I am afraid that much of the talk of the importance of vital statistics is merely academic and perfunctory, even in the American Public Health Association. Official representatives of the various State and city sanitary services—many of them with very imperfect or no registration of deaths, and none of them with satisfactory registration of births—will come to these meetings year after year, and deal with every other sanitary question conceivable—except vital statistics in a way that means business. It is of no use merely to talk about lack of registration and deplore it, unless we can *do* something. But we have never really tried to do anything, with well-organized, persistent energy. We have talked, and talked, and talked, and two years ago the Association became so weary of talking over the subject (or perhaps it was thought that the subject was exhausted) that the regular Committee on Demography was dropped and vital statistics were left entirely out of the program. Perhaps it did us good, for we have come back to you with a Section on Vital Statistics this year, and many registration officials are in attendance who have never heretofore participated in your counsels. We have organized to *act*, but, before we proceed, we must know whether the American Public Health Association really believes that this is important, and the

most important single object to which the efforts of sanitarians should be devoted.

Vital statistics is the Cinderella of modern public hygiene. She sits in the chimney-corner and sifts the ashes of dusty figures while her proud sisters, Bacteriology and Preventive Medicine, go to the ball and talk about the wonderful things they have done. But the Prince's slipper fits no other foot, and when we descend to facts, and not mere empty bombast, about the results of administrative work, vital statistics, and accurate vital statistics, are our sole dependence. What do we know about infant mortality, which we are all so anxious to prevent, when not a single State or city in the United States has the data for a correct statement? It depends upon the accurate registration of *all* births. What do we know about the real incidence of tuberculosis while health officers, acting as local registrars, allow deaths to be reported in such a way that many of them can only be classified, and studied for practical sanitary purposes, as "Probably tuberculosis," and "Possibly tuberculosis"? See "A Statistical Study of Tuberculosis in Philadelphia," in the First Annual Report of the Henry Phipps Institute for the Study, Treatment, and Prevention of Tuberculosis. The amazing thing about the way in which many deaths from tuberculosis are reported, as "Abscess of chest," "Brain fever," "Marasmus," etc., is the general indifference of registration officials to the necessity of securing accurate statements of causes of death. I sometimes think that the cause of registration has lost more than it has gained by being tied up, in this country, to public health work. Pure food, registration of physicians, osteopaths, and embalmers, inspection of milk, laboratory work, prevention of tuberculosis, sewage, water supplies, and a hundred other matters seemingly of more pressing importance and more fruitful of "practical" results, distract the attention of the administrative health officer from his registration records, whose compilation he is quite likely to turn over to the janitor or messenger. Not that a janitor may not develop into a faithful statistical clerk, but he is not likely to possess that medical knowledge which is indispensable for the proper treatment of causes of death. Every fad seems to have the preference, and I am not certain of my reply when I ask you if you really believe that vital statistics are *indispensable* to a modern public health service, and whether you think that it would be wise to direct all the energies of this Association toward bringing about the proper registration of all births and deaths in the United States.

Do you want a thorough system of registration of vital statistics for the United States?

Do the people of the United States want such a system? If they do, they can have one, and very promptly. It will not be necessary to wait

fifty or sixty years for the slow adoption and enforcement of adequate laws. The process can be hastened, and without departing from the Constitutional requirement that the primary control of registration shall be by the States, and not by the Federal government. If Congress, if the *people* of the United States, were really interested in this matter and were determined that this thing should be done, the States would readily be brought into line. But I am not even sure that the American Public Health Association would give its undivided and undistracted support to this *indispensable* (theoretically) object, and, while practical users of vital statistics are disposed to tolerate present conditions, the people and their legislative representatives may be pardoned for neglecting them.

PRACTICAL SUGGESTIONS FOR IMPROVING VITAL STATISTICS.

By Frederick L. Hoffman.

The accurate registration and qualified analysis of vital statistics is one of the most important functions of government. Vital statistics alone furnish a definite measure of the value of sanitary improvements and the progress of medicine and surgery. Vital statistics furnish the basis of an approximate estimate of national health, and they indicate with reasonable certainty tendencies making for national advance or deterioration. While considerable progress has been made in perfecting methods of registration and analysis, much remains to be done to secure uniformity in plans and purposes to increase the practical usefulness of the data collected. Much valuable material is collected which is not properly brought to public attention, and it is rather the exception than the rule that the official reports of health officers or registrars of vital statistics contain the extended and critical analysis of the vital facts of the community indispensably required for an intelligent understanding of the health history of the community. Most of the reports are limited to a crude presentation of the mortality data, and estimates of population are often arrived at by a method which falls little short of guess-work. As the result of a rather extended knowledge of methods of registration and the official publications of health departments throughout the United States and other countries, I have brought together a few suggestions for the practical improvement of our vital statistics, which, in one direction or another, may be applicable to the solution of local problems. Of necessity my remarks are limited to a brief statement of existing needs, with suggestions derived from actual experience. I am confident that most of the suggestions are entirely feasible, and that their adoption will materially improve the value of health reports for the purposes which they are intended to serve.

Annual Report and Sanitary Survey.

The annual report of the health officer should contain a brief sanitary survey of the locality reported upon, with observations upon the altitude, climate, surface geology, soil, subsoil, water supply, natural drainage, sewage and garbage disposal, and prevailing types of insects injurious to health. If possible, the report should be accompanied by a map

conforming to the standard of the topographic atlas sheets of the United States Geological Survey. Every ten years at least a special report should be prepared, conforming, on the whole, to the method adopted by the medical inspector of the Local Government Board for Ireland, in his Report on the Sanitary Circumstances and Administration of the City of Dublin, with special reference to the causes of the high death-rate.*

Preliminary Statement of Annual Mortality.

An abstract of the mortality from all causes and principal causes, including the mortality at certain ages, should be prepared as soon as possible after the close of the year, in conformity to the method adopted by the Department of Health of the City of New York. This report gives information for thirty-five specified causes of death, the mortality for four divisions of life, the general mortality by sex and color, with a separate statement of the mortality of Chinese, the deaths in institutions, tenements, dwellings, hotels, and a preliminary calculation of the crude death-rate.

Decennial Abstract of Mortality.

The mortality of the preceding decade should be presented in a convenient tabular form exclusive of the year reported upon, showing respectively the mortality from all causes and deaths by sex, color, and general nativity, also the deaths at ages under one and from one to five, together with the population accurately estimated for intercensal years.

* Report on the Sanitary Circumstances and Administration of the City of Dublin, with Special Reference to the Causes of the High Death-rate, by Surg.-Col. D. Edgar Flinn, F.R.C.S., D.P.H., Medical Inspector of the Local Government Board for Ireland, 1906.

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The method used in estimating the population should be stated in full, but, if possible, preference should be given to the arithmetical method for cities with a rapidly growing population. The mortality rates should be per thousand of population for the mortality from all causes and per ten thousand of population for specified causes. Deaths under one, and at ages one to five, should, in the absence of definite information regarding the corresponding population, be calculated in the form of a percentage of the deaths at all ages. This table should conform as far as possible to the method adopted by the Board of Health of the City of Boston, but in a somewhat more extended form.

Review of Mortality from Important Causes.

In the same manner the mortality from important causes of death should be reviewed for the preceding decade, exclusive of the year under consideration, including a statement of the actual deaths from each cause and the corresponding death-rates per ten thousand of estimated population for intercensal years. This method is admirably illustrated in the report of the Board of Health of Chicago, 1904–05. Among the more important causes to be considered should be small-pox, typhoid fever, malaria, phthisis, other tubercular diseases, all of the acute infectious diseases of children, pneumonia, other respiratory diseases, suicides, accidents, homicides, and deaths in pregnancy.

Early Vital Records.

Cities and towns with records extending over a long period of years should extend the decennial review for certain important diseases over the entire period of registration in the manner as this has been done in Table 13 of the Report of the Board of Health of Boston for 1906, and in the second volume of the Annual Report of the Department of Health for the City of New York (pp. 774–870). In this connection it may also be suggested that it would be of value if each registrar would state the history and extent of registration and give a catalogue of the books of record, such as will be found on pages 341 *et seq.* of the Annual Report of the Registry Department of the City of Boston for the year 1905.*

* Every board of health, municipal or State, publishing an annual report, should send a copy of the same to the Library of the Surgeon-General, U.S.A., Washington, D.C. This library has the largest collection of works on medical and sanitary science in the world, and the accessions are from time to time indexed in a subject index catalogue, of which a second series is now nearing completion. The library extends the loan of books and documents to qualified persons throughout the United States, under liberal rules and regulations, by which method the same become accessible to all. The library admirably serves the purpose of a central depository for reports of this character in the absence of properly supported medical libraries throughout the country, specializing in the direction of public health and sanitary science.

Mortality Record by Single Years of Life.

One of the most important additions to our present knowledge of human mortality would be a table of deaths by single years of life. No report of a board of health at present gives this specific information, which, for a variety of purposes, is of the greatest possible practical value. An attempt in this direction, however, is to be found in the annual reports of the Board of Health of Brookline, Mass., which require to be only slightly amplified to conform to the requirement stated. The Brookline report gives the mortality in the form of a running account of every death occurring, stating: first, the date; second, the cause; third, the sex; fourth, the conjugal condition; fifth, the exact age in years, months, and days; and, seventh, the occupation. In addition, however, the race and nativity should be stated. It may be difficult for large cities to present these facts in just the same manner, since in Brookline, during 1906, only 351 deaths were thus registered, but by means of this return any combination of facts can be worked out for a variety of purposes. Cities adopting the Brookline method should, however, in addition, tabulate the deaths, showing the number occurring at each age (and not by groups, as is the usual custom), with distinction of sex, color, and general nativity. Such a table would not require much labor, and would take up no more than a single page of the report. This method should also be adopted in the mortality reports of the census for the registration area of the United States.

Details of Infant Mortality.

The mortality of children should, if possible, be given by single months for the first two years of life and for the more important causes of death. As a rule, the mortality during the first year only is given by single months, but it would serve a very practical purpose to trace the course of mortality with greater accuracy by months during the second year of child life. This method has been adopted in the annual reports of the city of Berlin, and for the first year of life in the reports of the registrar-general of England and Wales. Wherever the information can be obtained, the distinction should be made between children breast-fed and bottle-fed, to trace with more accuracy the possibly injurious effects of artificial feeding. An excellent illustration of the method which should be adopted is to be found on page 50 of the Annual Report of the Medical Officer of Health of Blackburn, England, giving the particulars of the nursing and feeding of 2,705 children under seven months old visited by the inspectors of the department. The inspections were made by lady inspectors or health visitors, who also gave much valuable instruction to future mothers as a means of reducing infant mortality. It is hardly

necessary to add that the still-born should never be included in the statement of either births or deaths, but separately in a special table, with distinction of sex.*

Mortality of School Children.

The health and mortality of children of school age, say six to fourteen, should receive special consideration. A request might be made of school superintendents to report from week to week the deaths among pupils, so that at the end of the year a table could be prepared showing the average number of pupils in different schools according to different grades, together with the mortality occurring among the children, supplemented by a statement of the ages at death and the principal causes. There are few questions of more serious public interest at the present time than the problem of school hygiene and the possible effect of erroneous methods of instruction upon the health and mortality of the children. For illustration of the method which might be adopted, but which

* Infant and Child Mortality of Berlin, Germany,† 1905.

Ages under 1 Year.			
Ages.	Males.	Females.	Total.
Still-born	988	854	1,842
Found dead	15	11	26
1 day	398	277	675
2 days	187	121	308
3 "	116	85	201
4 "	53	43	96
5 "	48	30	78
6 "	40	35	75
7 "	41	29	70
1st week	898	631	1,529
2d week	302	210	512
3d and 4th weeks,	488	394	882
1st month	1,688	1,235	2,923
2d "	685	526	1,211
3d "	664	449	1,113
4th "	512	389	901
5th "	431	331	762
6th "	349	286	635
7th "	297	283	580
8th "	254	238	492
9th "	249	208	457
10th "	221	170	391
11th "	207	176	383
12th "	173	149	322

Ages 1 to 5 Years.			
Ages.	Males.	Females.	Total.
13th month	148	138	286
14th "	129	112	241
15th "	112	122	234
16th "	83	78	161
17th "	79	79	158
18th "	58	60	118
19th "	54	64	118
20th "	48	55	103
21st "	52	61	113
22d "	46	41	87
23d "	51	36	87
24th "	27	39	66
1st year	5,730	4,440	10,170
2d "	887	885	1,772
3d "	320	285	605
4th "	213	210	423
5th "	132	137	269

† Statistical Year Book, City of Berlin, 26th issue, 1907, p. 65.

should be simplified to show the ages at death, see "Health at School," by Clement Dukes, published in London in 1905 (page 547).

Mortality Record of Institutions.

For cities and towns which have large institutions, such as hospitals, asylums for the insane, prisons, almshouses, military academies, universities, etc., special tables should be given, showing the mortality among the inmates of such institutions, according to age at death and the principal causes, together with a statement of the average number of inmates of the institutions reported upon. Such tables would prove of very considerable value in connection with special mortality investigations, and at the same time correct erroneous conclusions regarding the health and mortality of particular localities. Illustrations of the method to be adopted are to be found in the annual reports of the various soldiers' homes and the numerous reports of asylums for the insane, and prisons, showing the death-rate among the persons under observation. These tables, however, as a rule, do not conform to the general method of showing the mortality at different ages and for specified causes conforming in principle to the international classification of causes of death.*

* For a very valuable table of mortality, by single years of life, useful for institutions such as prisons, asylums, almshouses, etc., the report of the managers of the National Home for Disabled Volunteer Soldiers should be consulted. The report of the board for 1906 was prepared by W. E. Elwell, surgeon-in-chief, and from a table on page 136 I extract the mortality by single years of life for ages 60 and upwards as follows:—

MORTALITY OF INMATES OF SOLDIERS' HOMES, YEAR ENDING JUNE 30, 1906.

Ages	Number Cared for.	Number of Deaths.	Number of Deaths per 1,000.	Ages.	Number Cared for.	Number of Deaths.	Number of Deaths per 1,000.
60	1,598	62	38.80	81 . . .	299	39	130.43
61	1,936	97	50.10	82 . . .	257	38	147.86
62	2,249	95	42.24	83 . . .	165	24	145.45
63	2,368	100	42.23	84 . . .	170	22	129.41
64	2,200	105	47.73	85 . . .	158	15	94.94
65	2,199	120	54.57	86 . . .	127	15	118.11
66	2,329	108	42.08	87 . . .	71	15	211.27
67	1,844	95	51.52	88 . . .	55	7	127.27
68	1,769	115	65.01	89 . . .	35	1	28.57
69	1,627	86	52.86	90 . . .	14	3	214.29
70	1,303	104	79.82	91 . . .	13	3	230.77
71	1,167	102	87.40	92 . . .	21	2	95.24
72	1,197	88	73.52	93 . . .	9	1	111.11
73	983	87	88.50	94 . . .	13	2	153.85
74	844	64	75.83	95 . . .	6	2	333.33
75	744	71	93.03	96 . . .	6	–	
76	787	81	102.92	97 . . .	2	–	
77	574	65	113.41	98 . . .	5	1	200.00
78	479	45	93.95	99 . . .	2	2	1,000.00
79	412	53	128.64	100 . . .	1	1	1,000.00
80	349	54	154.72	104 . . .	1		

Fatality Rate of Institution Mortality.

For hospitals and similar institutions a special table should be given, showing the rate of fatality accurately calculated in conformity to the principles adopted by the London Metropolitan Asylums Board. The method, however, should be amplified to show the mortality from surgical operations. Valuable suggestions for the method to be adopted will be found in the annual reports of the Johns Hopkins Hospital of Baltimore. Most of the reports of hospitals and institutions are decidedly defective and more or less misleading, and uniformity of treatment, as well as improved statistical methods, are imperatively required. Since it is much more difficult to induce the different institutions to make necessary changes, it would be advisable for health officers to insist upon an accurate and specific return, to be incorporated in the annual municipal or state report.

Redistribution of Deaths in Institutions by Sanitary Districts.

Deaths in institutions should be redistributed according to the place or district of residence of the deceased, primarily, of course, to secure a more accurate return of the mortality by wards or minor sanitary divisions. No local sanitary survey can be of much value unless the actual mortality of each district is properly known, and serious errors result where the deaths in institutions are not redistributed according to the place of residence of the deceased. The effect of this error is particularly serious where hospitals for the treatment of special diseases, such as cancer and tuberculosis, attract a large number of patients from other sections of the city or the near-by country. This is probably one of the most serious underlying errors in most of the mortality reports of American cities, and, as I recall it, not even the city of New York makes a proper redistribution of deaths in institutions to correct the ward death-rates as published in its annual reports. If it is possible to make these corrections for as large a city as London, it would seem readily possible to do so for our large American cities. Claims are sometimes made, as in the case of New Orleans, that the entire mortality occurring in a large hospital should be deducted in the calculation of the local death-rate. There could be no more serious error in vital statistics than this, for it will be found upon careful inquiry that the actual mortality of non-residents in local hospitals is never as large as is hastily assumed. The value of this method and its application to local conditions is emphasized in the reports of Dr. Billings on the vital statistics of New York and Brooklyn, Philadelphia and Boston, Washington and Baltimore, published in connection with the census of 1890. An equally valuable and perhaps still more instructive illustration is

to be found in a map appended to the Annual Report of the Medical Officer of Health of Blackburn, England, for the year 1906, showing the death-rates in the enumeration districts of the borough of Blackburn. The existence of insanitary areas is readily traced by means of such maps, and the returns are, of course, of the greatest practical value when conceded to be accurate.

Mortality from Special Causes by Streets.

In connection with local inquiries into the causes of a high death-rate, it may be advisable to compile the mortality by streets, in much the same manner as this has been done for a number of years for Liverpool. For illustration, to emphasize the prevalence of diarrhœa during the year 1905, a table was prepared showing the mortality by streets on which three or more deaths from this disease occurred. It would not be difficult to obtain an approximate estimate of the populations of the different streets and to localize the mortality from any specific cause by this method.

Description of Sanitary Districts.

As a further aid in deliberate efforts to localize the causes of a high death-rate, the method adopted by the Registry Department of the City of Boston will be found of value, which includes a full account of the elements of population and the mortality of every ward in the city, including a brief but very comprehensive account of the topography and sanitary condition. The report is published as City Document No. 34, forming a very useful supplement to the report of the Department of Health.

Localization of Nuisances.

The presence of establishments more or less injurious to health, or which otherwise come within the category of local nuisances, may properly be indicated on a special map in much the same manner as this has been done in the biennial report of the Department of Health for the City of Chicago for the two years ending with 1905. This report contains a very instructive map showing the slaughtering and rendering plants, with the distinction of such as manufacture glue or fertilizers, also of tanneries and wool-pulling plants, which occupy considerable areas in the stock-yard district of the city. An amplification of this method will be found in the *Journal of American Sociology*, Volume VII, for 1901.

A similar method of emphasizing insanitary areas, or conditions giving rise to causes injurious to health, will be found in the first volume of the Report of the Department of Health of the City of New York

for the Year 1904, showing, among others, by means of a map, in part, the polluted watercourses of Staten Island, and places where oysters are freshened and unquestionably contaminated. A still more elaborate map, showing locations of stations in Boston harbor at which samples of water and shell-fish were collected for analysis, will be found in the Annual Report of the State Board of Health of Massachusetts for 1905.

Relation of Weather to Disease.

Epidemics of mortality from causes more or less connected with the weather, such as sunstroke and pneumonia, should be returned by single days for the period of exceptional frequency, supplemented by a daily record of the more important meteorological elements, in particular barometric pressure, minimum and maximum temperatures, rainfall, and humidity.

Mortality Rate from Infectious Diseases.

The mortality from contagious diseases should be supplemented by a table showing the number of reported cases, with distinction of age and sex. The fatality rate should not only be calculated in proportion to the total number of cases, but also separately, either by single ages or by periods of life. An illustration of this method will be found on page 45 of the Twenty-fourth Annual Report of the Superintendent of Health of the City of Providence, R.I., for the year 1906, showing the fatality rate from diphtheria for seven selected periods of life, first for the eighteen-year period, ending with 1905, and, second, for 1906 separately. The table, however, is for both sexes combined, which impairs its value, since it is desirable to have the information separately for the two sexes. It is also more advantageous to limit the comparative period to ten years instead of eighteen. An amplification of this method will be found on page 175 of the Annual Report of the London Metropolitan Asylums Board for 1906 and on page 39 of the Annual Report of the Medical Officer of Health of Manchester, England, for 1906.

Relative Value of Different Elements of Mortality.

The mortality returns by months should not be unduly elaborated, but limited to a few suggestive tables. Most of the board of health reports give an elaborate analysis of the mortality by months, which is of very limited value, instead of giving the necessary data by ages at death, which is absolutely indispensable. Of course, the mistake has its origin in the fact that the annual report, in most cases, constitutes a combination of the twelve monthly reports, but it would lead to a decided improvement if the analysis by months were eliminated in

many cases, and were replaced by tables showing the relation of age to cause of death. For many important purposes it is absolutely indispensable that the age and sex distribution of the mortality should be clearly stated, and every report should contain a complete statement of the mortality by important periods of life for each sex. This is the method which has been used practically from the beginning in the reports of the Registrar-General of England and Wales, and which also has been successfully carried through most of the tables of the United States census mortality reports. The vital statistics of the census, however, still continue to unduly elaborate the factor of season instead of giving due consideration to the far more important and fundamental elements of age, color, nativity, occupation, etc. As a matter of fact, the use of monthly death-rates has an extremely limited practical application, for, unless the mortality is given by days, it is next to impossible to trace the proper relation of diseases or mortality frequency to meteorological changes and departures from the normal. The annual mortality reports prepared under the direction of Mr. Wilbur are a decided improvement in this respect, but even these could be materially improved by a more complete separation of the mortality of the white and colored populations. I believe that it may be laid down as an axiom that, wherever the colored population exceeds 10 per cent. of the total, it should be considered the duty of the board of health to entirely separate the two mortalities and present the facts for each race by itself.

Mortality of Residents and Non-residents.

Every board of health report should clearly distinguish between the deaths of the resident and the non-resident populations, but only in the case of health resorts does it appear advisable to consider separately the mortality of non-residents in the calculation of the local death-rate. While the theoretical assumption probably does not hold entirely true, that the mortality of non-residents is balanced by the mortality of residents dying elsewhere, it will be found next to impossible to ascertain the facts with entire accuracy, except, possibly, in small communities. For illustration, the Board of Health of Brookline, in its report, makes a special tabulation of the deaths of Brookline residents who died in other places, and another of the deaths of residents of other places who died in Brookline. From various sources every health officer is likely to come into possession of information as to the deaths of residents in other places, and it perhaps would be advisable to make mention of such deaths in the report, without, however, incorporating the facts in the local mortality table. It would be a very important contribution to our knowledge of local mortality if mention were made of all

the important facts of this character, among others, for illustration, of deaths of residents occurring in tropical countries, such as Panama, the Philippines, etc., of deaths of residents occurring at sea, or deaths of residents committing suicide in other places, or who were murdered elsewhere, or whose lives were lost in railroad or other accidents. All such cases should be given, together with a statement of the age, sex, race, and nationality of the deceased, the place where the death occurred, and the cause in such detail as may be obtained. Where this method is adopted, the health officer will be, in fact, the public guardian of the life and health of *every* person properly considered a resident of the community, subject to the health department's jurisdiction, and a large amount of valuable information will be obtained regarding obscure deaths, which at the same time form an important element of vital statistics.

Suspicious Deaths and Coroners' Returns.

Coroners' returns should be given separately in addition to having been previously included in the general mortality tables. These returns are notoriously inadequate, and complaint as to their accuracy is universal, not only in this country, but abroad. As a Departmental Committee of the British Home Office observed in 1899, "We are so much impressed by the insufficiency and untrustworthiness of the statistics relating to particular causes of mortality which can be gathered from returns of coroners' verdicts that we venture, though the matter is outside the terms of reference to us, to recommend strongly that some steps should be taken to secure that these verdicts should lend themselves more readily to clear classification by the Registrar-General; and, in particular, we suggest that in every case where the coroner is in possession of a medical certificate of death, or where medical evidence has been taken at the inquest, a copy of that certificate, or an abstract of that evidence, should be appended to the coroner's certificate when sent to the Registrar-General." A separate return of inquests by coroners, or medical examiners, as they are known in certain New England States, forms a valuable appendix to the registration reports of Rhode Island and Massachusetts, but they are not in such detail as would be desirable. The Rhode Island returns omit the sex and age, but the individual observations are quite valuable. Considering, however, the great importance of complete knowledge regarding all sudden, suspicious, or violent causes of death, a statement in more detail would lead to a material improvement and increase the practical value of our vital statistics. It would not be going too far if the report were to give a complete individual account of every suspicious or violent death, not in the form of a tabulation, but in the form of a brief but continuous sum

mary, somewhat after the method used by coal mine inspectors in their reports upon fatal accidents and the method used in the annual reports of the Board of Gas and Electric Light Commissioners of Massachusetts. A valuable summary of gas accidents will be found on pages 100 *et seq.* of the report for 1906, and a valuable table of electric accidents on pages 109 *et seq.* of the same report.

Descriptive Record of Deaths of Exceptional Interest.

Deaths of exceptional interest should be individually made note of without necessarily any attempt at tabulation. Upon many important health problems our present information is very limited, due to the fact that cases of exceptional interest or rare occurrence are included in the statement of the general mortality. This, for illustration, is true of deaths among persons of races and nationalities as yet only represented in this country in very small numbers, as in the case of Chinese, Japanese, Filipinos, Hawaiians, Porto Ricans, Syrians, Turks, etc. All such deaths should be briefly reviewed, together with a statement of the age, sex, race, nativity, and cause of death. This is also true of deaths from exceptional diseases, such as leprosy, anthrax, etc. For illustration, the annual report of the State Board of Health of Massachusetts for the year 1905 contains the statement that a death from anthrax occurred in Lynn, and that one death from leprosy occurred in Boston, and another in Wareham. While this statement is of interest, and valuable as a matter of record, no intelligent meaning is conveyed by a reference limited to mere numbers. It is certainly of sufficient public interest to know the class of people among whom such rare diseases occur, and for any attempt to trace the possible course in the spread of such diseases more information is necessary, which cannot be had without access to the original death records, which also may fail to give a sufficient explanation. It would take very little time, and would add materially to the value of vital statistics, if all such cases were commented upon in some detail. This is also true of deaths among abnormal persons, such as giants, dwarfs, persons of great weight, and others which may be classed among the abnormalities or curiosities of medicine. The human life which is at stake in such cases has its own distinct value, and, while reports of such cases are made in medical journals or in the proceedings of medical societies, it is nevertheless important that they should also be mentioned and briefly reviewed in the reports of the local board of health. In all such cases, however, the sex, age at death, race, and nativity should be stated, together with the cause.

Race and Mortality.

Next to age there is probably no more important element in vital statistics than race. Every city which has more than 10 per cent. colored population should publish in its annual health report, in the form of a separate table, the mortality of the colored population, according to age, sex, and cause. Cities containing a fair proportion of Asiatics, such as the cities on the Pacific coast and some of the large cities in the East, should present the mortality of the Chinese, Japanese, etc., separately, with due regard to age, sex, and cause of death. While, for illustration, the Annual Report of the Health Department of San Francisco contains a table of the estimated Mongolian population and the deaths occurring among the same during a period of twenty-five years, the table does not show the causes of death among this class, by ages at death, without which it is impossible to arrive at any definite conclusions regarding the mortality and specific disease liability of this class of foreigners. Where the number of such deaths is small, it is fully sufficient to give the facts briefly, without any attempt at tabulation, sometimes in the form of a foot-note to the regular tables. For illustration, the Fifty-first Annual Report of the City of Providence for the Year 1905, on page 14, gives a total of the white and colored mortalities since 1855, but there is no specific information as to the causes of death among the colored, which would be of great value in connection with mortality investigations among the negro population in the North. The same volume contains a report of mortality by nativity and parentage, stating, among others, that there were deaths of Greeks, Turks, Syrians, Chinese, Armenians, etc., but with no information as to the age at death and the cause. The cumulative value of such information in detail would be very great.

Mortality from Industrial Diseases and Accidents.

Deaths among persons employed in dangerous or unhealthful trades should be commented upon in detail and at some length. The number of such trades is not very large, and is usually concentrated upon a few locally important industries. The method of presenting occupation mortality statistics is, as a rule, very crude, and the tables printed are of very limited practical value. The best work in this direction is to be found in the annual reports of the medical officers of health of Sheffield and Blackburn, England. In the former the cutlery trades are the most important, and in the latter the textile industries. The Blackburn reports are a model well deserving of adaptation by every board of health of cities in which cotton and woollen mills give employment to a large

proportion of the population. What is practicable for Blackburn, England, should not be more difficult for Fall River, Lawrence, Lowell, etc., and, if such tables were introduced, they would for the first time afford an accurate insight into the extent of industrial diseases in this country. The reports of the State Board of Health of Rhode Island contain much valuable information upon this subject, but they fall short of the required details in that only the average age at death is given among men dying in different employments instead of the age distribution by divisional periods of life and from the more important causes. There is no need for any very extended elaboration of the causes of death, most of which have no connection with the occupation followed. A selection could readily be made for different localities, but, on the whole, the method adopted in the decennial supplements to the reports of the Registrar-General of England and Wales will be found most useful. Where the reports are limited to particular trades, such as the textile industry, where, of course, the chief causative factor is dust in its relation to diseases of the lungs and air passages, the causes of death need not extend beyond tubercular and respiratory diseases and accidents. It would always be advisable, however, to give the facts separately for such diseases as asthma, bronchitis, pneumonia, etc. Dangerous trades, in which fatal accidents are likely to occur, such as iron and steel works, should be reported upon in detail for the different important branches of the industry, or, if this is not feasible, then a simple but continuous record of every fatal accident occurring should be given, stating the age, specific occupation, and cause of death of the deceased.

Modification of Occupation Clause in Death Certificates.

In this connection it may be well worth while to consider whether it would not be advisable to modify the death certificate now in use by the Census Office and local registrars of vital statistics, to the extent that two questions should be answered with respect to occupation: first, the certificate should state the industry in which the deceased was employed; and, second, the specific employment followed. Not only are there many occupations of the same name, but in entirely different industries, but the industry itself may be confused with another of a similar character. This, for instance, is true of the pottery industry, hat-making, iron and steel works, glass works, etc. If these suggestions were adopted, the certificate would state, for illustration, in the case of a glass worker, that he was employed in the glass industry, but that his specific employment was, say, that of a pot-maker. In the iron and steel industry it would be stated that, while deceased was employed in the iron and steel industry, his specific employment was that, say, of

a furnace keeper. Such a record would prove invaluable in connection with special mortality investigations, such as, for illustration, is at present being conducted in behalf of "***Charities and the Commons***" in the city of Pittsburg, as part of what is called the Pittsburg Survey of Social, Sanitary, and Industrial Conditions. There are few subjects of greater practical importance likely to receive extended consideration in the near future than industrial diseases and industrial accidents. The agitation for employers' liability laws, following the progress of such legislation in England under what is known as the "Workmen's Compensation Acts," must needs rest upon accurate data, which at present is next to impossible to secure for this country. For an illustration of the method which should be adopted, the second volume of the decennial supplement to the Fifty-fifth Annual Report of the Registrar-General of England and Wales should be consulted, also the supplement to the Forty-eighth Annual Report of the Registrar-General of Scotland. The last-named report is the most recent contribution to occupation mortality, which will soon be followed by the second volume of the supplement to the Sixty-fifth Annual Report of the Registrar-General of England and Wales. which is now in course of being printed.

Mortality from Accidents.

Accidents should be returned in some detail to show the causes, together with the ages at death, with distinction of sex. It does not serve a very practical purpose to merely state the number of accidental deaths from all causes, and not even the international classification is entirely sufficient. The causes of industrial accidents, as far as possible, should be separately stated, and it would be better to give more attention to details in the case of accidents than to details of the method employed in suicide. A tabular presentation of such facts will be found in the second volume of the Annual Report of the Department of Health of the City of New York for 1904, pages 760 *et seq.*, but, unfortunately, the table does not make the distinction of sex and age, which is decidedly important. A more satisfactory method of presenting the facts relating to deaths from accidents and negligence at different periods of life and in full detail for thirteen classes, subdivided into many minor groups, will be found in the Sixty-eighth Annual Report of the Registrar-General of England and Wales for 1905, pages 398 *et seq.* A somewhat similar table is contained in the sixty-third registration report for Massachusetts, for 1904, pages 120 *et seq.*, being the tabulation of the deaths investigated by medical examiners. Every such table, however, requires to be supplemented by intelligent observations or comments upon such accidents as are of public importance and which might suggest methods by which their occurrence could be prevented. It is probably

one of the most serious defects of all mere statistical representation of numerical aggregates that the value of the individual item is obscured. The law of large numbers applies only to vast aggregates, and not to such cases as represent decided variations from the normal. It serves only a very limited practical purpose to be told that there were four deaths from actinomycosis, two from glanders, and six from anthrax, or malignant pustules, in Massachusetts in 1904. To give such statement practical value, it is necessary to state the age, sex, and occupation of the person dying from such rare and infrequent causes in connection with collateral facts explaining their occurrence.

Mortality from Homicide.

Homicides should be reported in detail, with a statement of such facts as may have come to the notice of the health department. In all cases the age, sex, and race of the person dying a violent death should be stated and the method by which the life was terminated. Such cases, also, might be amplified by a brief explanation, to form a continuous public record of deaths from violence in the different communities. Here, again, our health reports are very defective, and the defect is so much more to be deplored in view of the extremely high rate of homicide frequency prevailing throughout the country. The English returns distinguish between murder and manslaughter, and the returns make the further distinction of sex and the method of murder employed. As far as practicable, the classification of method follows the method of suicide and the cause of accidents. While judicial statistics relate to the person committing the murder, such statistics do not throw sufficient light upon the fact as to the victim. Such returns, however, should not only be in the aggregate, but in addition state the age, sex, and method of death.

Mortality of Paupers.

Deaths of paupers should be stated separately, together with a statement of the mode of interment or disposition of the body. At present a serious defect exists in the vital statistics of some of our cities, in that they do not afford an accurate insight into the record of pauper burials, usually so referred to. Certain cities return a low pauper burial rate for no other reason than that the bodies of paupers are turned over to medical institutions. Of course, the deaths, as such, have been registered in the usual manner, but for certain purposes it is desirable to know the number of persons who come within the designation of the pauper class and whose bodies were not disposed of in the usual manner. Of course there is a further distinction to be made between pauper bur-

ials and pauper funerals, but it would seem advisable to give a table in the annual report, showing the disposition of bodies according to the different methods which may have been adopted; that is to say, whether the bodies were buried in public cemeteries or the potter's field at public expense, or whether the remains were turned over to medical institutions. I am not aware that any such record exists at the present time. A table stating pauper burials has a decided social and economic value, and it is a matter of regret that the returns should be so fragmentary and more or less inaccurate. All who are interested in this particular question should consult the Thirty-seventh Annual Report of the Sanitary Department of the City of Glasgow for the Year 1906, which contains an exceedingly interesting report upon the interment of unclaimed and other bodies, by Mr. P. B. Mackintosh, for thirty years one of the chief clerks of the department, performing the duty of seeing all those decently buried who, from one cause or another, died in poverty or were found dead in the city, leaving no one behind or sufficiently interested to afford the body interment. This very instructive report supplements the classical report by Edwin Chadwick on "The Practice of Interment in Towns," printed in 1843, and the more elaborate Report of the Select Committee of the House of Commons on Death Certification, published as a Parliamentary paper in 1893.

Necessity for a Complete Record of Deaths.

Every health officer should consider it his duty to obtain a complete account of the disposition of every body of a deceased person within the limits of his jurisdiction. Much valuable evidence upon this point will be found in the first and second reports of the Select Committee on Death Certification previously referred to. The disposition of bodies should be accounted for by cemeteries, crematories, or otherwise,—by otherwise, I mean the possible and entire destruction of a body in the event of explosion, by fire, drowning, etc. For illustration, deaths have occurred of miners whose bodies were never recovered, and workmen have been covered by molten metal in the explosion of furnaces, with the result that the bodies were entirely destroyed. It is manifest that such body destruction should be accounted for separately and distinct from the cemetery returns.

Description of Cemeteries and Method of Interment.

Every health report should also contain a brief account of the different cemeteries, their areas, and the probable number of interments in the same. Cities having crematories should return a separate record of the cremations in such establishments, and a valuable table will be found in the

Annual Report of the Board of Health of the City of Boston for 1906, which includes a review of cremations throughout the world from the inception of this practice. Such returns, however, should state the cause of death, as well as the ages of the persons cremated, to afford a more complete insight into this practice. For further information the report of a Departmental Committee of the British Home Department, appointed to draft regulations to be made under the Cremation Act of 1902, should be consulted. This report includes regulations for the maintenance and inspection of crematories, the conditions under which cremations may take place, disposal of ashes, and the registration of cremations.*

Descriptive Cases of Exceptional Longevity.

Exceptional cases of longevity (that is, persons dying at say age ninety or over) should, as far as possible, be verified by the health officer and explained in detail. The second volume of the Report of the Health Department of the City of New York for 1904 (page 768) contains a table of the deaths of persons one hundred years of age and over, giving the date of death, age, name, nativity, cause of death, and the borough in which the death occurred. There is, among others, the death of a Russian woman aged one hundred and six years and three months, but there is no evidence as to the facts in the case. As a check upon errors widely prevailing regarding old age, and the material improvement in longevity during recent years as the result of sanitary advances or more perfect medical practice, it would be advisable to amplify such records by the results of a special inquiry. It will be found, almost without exception, that such cases of very extreme old age are reported in the case of colored persons, or persons of Irish or Russian birth, or of certain other European nationalities, for which certificates of birth are practically unobtainable. An exaggeration of such cases is in part claimed to be the cause of an apparent increase in longevity according to recently constructed life tables, which are made to rest upon the recorded age at death, but not upon the deaths of persons actually living to the ages stated. The subject has been very carefully investigated by Mr. T. E. Young, formerly president of the Institute of Actuaries, in a remarkable essay on Centenarians, published in 1899. A very instructive address upon the subject of old age, by Metchnikoff, was printed in the Smithsonian Report for 1904. While it is possible, and perhaps probable, that old age is attained in larger proportions than formerly, it is of the greatest importance to have the facts properly authenticated and verified.

* The Annual Report of the Health Commissioner of Milwaukee for 1906, p. 102, contains an illustration of a method which might be followed. The table includes the statement that, out of 5,387 bodies, 16 were used for anatomical purposes.

Population Estimates.

Population estimates for intercensal years should be fully explained, and every safeguard should be employed against an overestimate of the population. An estimate, however, is in all cases preferable to a repetition of the census returns for a certain year, and death-rates should not be calculated upon such a basis of population, as is sometimes the case. A stationary population in an American city is an anomaly and is very rarely met with. Cities decrease or increase in population, and almost without exception the latter is the general rule. For cities normally increasing in population by an excess of births over deaths the geometrical rate of increase is probably the most satisfactory. Cities increasing in population by an excess of births over deaths and an excess of immigration over emigration will probably best employ the arithmetical method of estimating population. A full explanation of these different methods will be found in "The Elements of Vital Statistics," by Dr. Arthur Newsholme, medical officer of health of Brighton, England, while a brief statement of the principles will be found in Harrington's "Practical Hygiene." For more extended comment upon the estimating of population, the first volume of the supplement to the Sixty-fifth Annual Report of the Registrar-General of England and Wales should be consulted, which contains the "Observations on Population Estimates," by A. C. Waters, F.S.S., chief clerk of the General Registry Office. The subject is also discussed in the mortality statistics of the Division of Vital Statistics of the Census Office, and among others in the Sixth Annual Report for 1905 (page 4). The accuracy of population estimates becomes doubtful after the fifth year intervening between the taking of two decennial censuses, and, where there is no State census under proper management and supervision, recourse must be had to police enumerations, directory estimates, new buildings erected, etc., as a check upon possibly exaggerated estimates of population. It is much to be desired that the federal government should take a population census every five years, limited to the age, sex, race, and nativity constitution of the population.

Crude and Corrected Death-rates.

The crude death-rates as generally calculated, per one thousand of estimated population, cannot serve as an accurate method of comparison with other cities or towns even of equal population, unless the evidence is satisfactory that the sex, age, and race constitutions of the two populations were nearly the same. Even a comparison of the local death-rate with earlier years is likely to be misleading, if important changes in the elements of population have taken place during the in-

tervening period. All crude death-rates require to be corrected for such changes and differences in the elements of population, and the method of calculating corrected death-rates is also fully explained in "The Elements of Vital Statistics," by Dr. Newsholme. A brief explanation of the method of correcting the local death-rate is to be found on page 701 of Harrington's "Practical Hygiene."

Mortality Rates by Divisional Periods of Life.

Every health report should, if possible, contain a table showing the mortality rates for all causes, and specified causes, by divisional periods of life, calculated upon the basis of the number of living population at corresponding ages. Such tables may be calculated with approximate accuracy upon the basis of the age distribution as ascertained by the last census and applied in the form of a percentage to the population estimated for intercensal years. The method is admirably illustrated in the tables which have been published for many years in the annual reports of the Registrar-General of England and Wales, among others on pages 13 *et seq.* of the report of this official for the year 1905. In these tables the general death-rate for all ages has been corrected for changes in the age and sex constitution of the population since 1856, but specific death-rates are calculated for twelve divisional periods of life, with distinction of sex. (See also the Annual Report of the Medical Officer of Health for Manchester, England, for 1906, pages 14–15.)

Approximate Life Tables.

For localities with a reasonably stable population, not subject to an undue influx of foreigners or non-residents, approximate life tables may be calculated upon the basis of a ten-year average mortality, either by the approximate method adopted by Dr. Billings for certain American cities in connection with the censuses of 1890 and 1900 or the more refined methods adopted for certain English cities, such as Brighton, Oldham, Manchester, etc. Extreme care in the calculation of life tables, however, is necessary, and it is imperative that they should represent the true facts rather than a mathematical fiction. If the errors in age enumerations of the population are too apparent and too wide apart from the probably true condition, no method has yet been devised, nor is there any law of error, by which such disharmonies can be reduced to a normal basis, whether it be the graphic or any other method known to actuarial science. The errors and fallacies in life tables are, unfortunately, very far from being generally recognized, but they were never more clearly set forth than by Dr. Rumsey in his address before the

Manchester Statistical Society, where he discussed the question, "Are Life Tables, National or Local, Evidence of Sanitary Condition?" The essays were republished in 1875 under the title "Essays and Papers on Some Fallacies of Statistics concerning Life and Death, Health and Diseases, with Suggestions towards an Improved System of Registration."

These are only a few illustrations of the direction in which the practical value of vital statistics can be very materially increased. Many matters have been necessarily left out on account of the limitation of space. Among those which perhaps should have been included are graphic representations of statistical results in the most readily comprehended form; the statistics of childbirth, by ages of mothers and previous issue, as admirably illustrated in the reports on the vital statistics of New South Wales; the mortality of the married and single, by ages at death and causes in a somewhat more extended form than was used in the Census of 1900. To some of these I have had occasion to call attention in my review of "The Vital Statistics of the Census of 1900," published in the *Quarterly Publications* for December, 1902, and "The General Death-rate of Large American Cities, 1871–1904," published in the *Quarterly Publications* for March, 1906.

THE IMPORTANCE OF UNIFORM METHODS IN THE PRESENTATION OF VITAL STATISTICS.

By Wilmer R. Batt, M.D., State Registrar of Vital Statistics of Pennsylvania.

The Act of Congress of March 6, 1902, establishing a permanent Census Bureau, and providing for the publication of annual instead of decennial reports, marks the beginning of a distinctly new epoch in the collection of vital statistics in this country.

By this action the work has not only been vested with the just appreciation which its importance warranted, but it presumes for the future a degree of accuracy and reliability of data which can only be derived from a continuous and not from a periodical operation of a statistical bureau. There will be no more ten-year comatose periods in our vital statistics, and in the future it will not be possible for half of a generation of our people to appear and disappear without some definite knowledge of their coming and their going. It is not too much to say that this substantial national recognition of a national necessity is, and must forever remain, the most important event in the history of our vital statistics. It is, furthermore, not inappropriate to state at the same time that this result must stand as a monument to the Bureau officials of the Census Office; to the ability and zeal of those citizens who, as individuals, labored so effectively in the cause; to the support of the organized medical societies of the country, and, last and by no means the least, to the influence of the American Public Health Association.

But slightly secondary in importance to the establishment of a permanent Census Bureau was the action of Congress of Feb. 11, 1903, when by preamble and resolution the value of vital statistics was impressively set forth and the necessity for State legislation emphasized. The immediate effects of the acts above referred to, supplemented by the vigorous work of the Census Bureau, are to be found in the pamphlet on the "Extension of the Registration Area for Births and Deaths," issued November, 1906, in which the announcement is made that five additional States have enacted and inaugurated laws sufficiently comprehensive to entitle them to recognition and inclusion in the permanent registration area, and that a number of others give promise of inclusion in the near future. The net result has been the addition of 8.0 per cent. of our total population to the area for the registration of deaths.

In reality the extension is of much greater importance than this percentage would indicate for the reason that a number of large cities with extensive populations in the added territory were already included in the registration area through the operation of purely local laws, but it may be safely assumed that the true index of statistical sentiment and progress is not to be found in isolated municipal regulations, but in the legislative recognition which provides for State registration. The preponderance of statistics relating to urban population is likewise reduced through the admission of entire States, and a better analysis is afforded of results under a wider variety of actual conditions. Expressed in proportion to the total number of States and Territories, the registration area in 1900 represented 22 per cent. of the total, and, in 1906, 32 per cent.

These facts show just what has been accomplished in the short space of five years in the matter of establishing uniform methods in the collection of mortality data. If these data are to have their greatest possible value, there remains for our earnest consideration the importance of uniform methods in their presentation for general use.

The Act of Congress of Feb. 11, 1903, before referred to, in urging the adoption by State legislatures of specific laws for the collection of vital statistics, also calls definite attention to the fact that the National Census Bureau is wholly dependent upon State legislation for the enacting and compulsory enforcement of such laws. The sovereignty of the several States in such matters is freely and fully admitted, and the actual definition thereby placed upon the work of the Federal office consists in the collaboration and analyses of such data as are transmitted to it through the medium of State registration offices.

Such being the facts in the case, the question naturally presents itself, If the information in detail forwarded to the Census Office is exactly identical with that received in State bureaus, should not the presentation of the aggregates as well as the separate groupings of facts in tabular form by the State and Federal offices exactly coincide?

It must be very evident, when entirely different results are reached by independent treatment in separate offices of supposed identical facts, that one or perhaps both compilations are inaccurate. In either event the value of the results is necessarily discounted and opened to serious question. During the period included in the decennial publications of the Census Office (1850–1900) any inquiry involving mortality statistics during intercensal years required the use of annual State reports. If the inquiry required comparisons between conditions in several States, the incongruity in the treatment of certain statistical facts often made useful comparisons impossible.

Futhermore, when the annual State reports for several years are

compared with census reports for the same periods, a disparity is frequently found, not in details alone, but in aggregates, to such a degree that it might easily be inferred that the compilations were based upon information derived from entirely independent sources. In fact, it requires but a glance to note the entire lack of uniformity existing between National, State, and Municipal reports of vital statistics, with the result that all must inevitably be more or less tainted with a suspicion of inaccuracy and incompleteness. The matter of correspondence in data between the State bureaus and the municipalities in registration States may be a question for local adjustment, and there may be some urgent reasons for the presentation of data relating purely to local conditions which might require special treatment, but as between the State and National publications there should certainly be a correspondence in aggregates and in the primary basic tables that would demonstrate an absolute uniformity in the methods of digesting and treating identical facts. Discrepancies that have heretofore existed in comparisons of the censal year reports will be in greater evidence in the comparisons of annual reports and less excusable.

It is rather confusing to the users of statistics to discover that the United States Census Bureau finds 157 more deaths for a certain year in one registration State than are admitted in the State report for the same year; or that in another State it finds 601 more deaths than the State records for the same period; or that, according to the census reports, 259 more people died in a certain State during a given year of organic heart disease than the same State reported. Of course, when assignments to titles are made by several persons acting independently of each other, especially in the case of joint causes, where individual preference in the absence of any hard-and-fast rules very largely determines the choice, we would certainly expect to find disagreements.

Heart disease probably occurs more frequently in joint causes of death than any other single affection, and it might reasonably be urged that a comparison of deaths under this heading is not a good index of discrepancies in treatment.

If, however, we compare the deaths from typhoid fever, concerning the assignment of which there should be the least doubt, we find similar disagreements. True, not as large a proportion as for heart disease, but enough to create a material difference in the rates accorded to this affection.

There should not be a disagreement in such definite causes as suicide and homicide, and yet we find that in one year a certain registration State reports 18 more suicides than the Census Office finds, another State 55 more, another 40 more, while yet another state report shows 14 more homicides than the census reports, and in another the con-

ditions are reversed, as the State reports 3 less. Discrepancies as to sex, age periods, nativity, color, and occupation must follow as a natural sequence when there is a variance in the total number of deaths from all causes or from any specific cause. The arrangement of titles shows, even in cases where the International Classification has apparently been adopted, that decided liberties have been taken with groupings and arrangements, making it difficult to locate certain titles, and that combinations or subdivisions of titles have been used without explanation, which makes comparisons impossible.

When municipal statistics are brought into the comparisons, we have simply added an additional element of uncertainty, for the disagreements noted between National and State reports are equally evident between State and Municipal reports.

In view of these facts, upon what basis can State registrars seek to defend the completeness or accuracy of their statistics, even so far as totalities are concerned, when placed in comparison or competition with Census Bureau reports based upon information supplied by their offices? Exactly the same proposition applies to local registration records, as compared with the State reports.

It is very apparent that the gradual perfection of statistical methods and the broadening of the registration area must result in a more extensive use of statistics, and consequently in a more critical examination of results. The development of statistical sentiment on the part of the public will also require that vital statistics must not only be published, but that they must be intelligently interpreted; that cause and effect be so clearly demonstrated that the conclusions drawn must be convincing to the public through the sheer force of their unanimity.

While it is true that the principal effort on the part of the Census Office has in the past been directed primarily to the extension of the registration area by the adoption of uniform methods in the collection of vital statistics (for without such data there should be no comparisons), the importance of uniformity in the presentation of such statistics has not been lost sight of.

The American Public Health Association at its annual meeting in December, 1902, by resolution recommended the "proper compilation and presentation of vital statistics." Exactly the same language was used by the American Medical Association in the resolutions adopted at the annual meeting in May, 1903. The preamble of the Act of Congress of Feb. 11, 1903, urges the importance of "a practical uniformity in the character and amount of information" available from statistical returns.

The Director of the Census in his introduction to the annual mortality reports of 1900 to 1904, in outlining the work to be pursued in the im-

provement of registration methods, speaks of the necessity of uniformity of tables and of classification. At the last annual meeting of this Association, Dr. Wilbur, Chief Statistician for Vital Statistics of the Census Office, in his "Report on the Condition and Prospects of Vital Statistics in the United States," speaks of the value which must inevitably accrue to all statistics through uniformity in presentation.* There is no division of sentiment upon the subject.

Such being the case, and the expediency of State and Municipal publications of vital statistics being admitted, how can uniformity in their presentation, as compared with each other and with national statistics, be secured, and how far in detail can it be carried out?

The first logical step in this direction would seem to be the adoption and use by States and Municipalities of the International Classification, both as to groupings and order of arrangement, exactly as it is employed in the Census Bureau. This may involve the sacrifice on the part of some statisticians of certain deep-rooted convictions which they may have concerning the practical utility of this classification.

Modern pathology, has indeed shown us the necessity of revision and extension of titles and arrangements, while medical nomenclature has at the same time so broadened the field of expression that assignment to titles and groups is constantly becoming more difficult.

When we stop to consider, however, the circumstances under which the International Classification was devised, and how extensively it has been adopted, that it forms the basis of our national vital statistical work, and that some such uniform method is urgently required, it would seem as though all individual sentiment in the matter should be thrust aside to the end that uniformity in the very primary work of tabulation should prevail, and that a common ground should be established for comparisons.

Moreover, the adoption and use of this classification would not prevent the statistician who desired to do so from expressing, in subsidiary tables or in text, any facts which to his mind required a different treatment or expression. It would not necessarily prescribe any limitations whatever, and would certainly not detract from the value of such work.

The uniform assignment of individual cases to identical titles by independent editors necessarily involves comparisons and mutual agreements. In the paper by Dr. Wilbur, before referred to, mention is made of the efforts now being made in several states to secure uniformity in assignments. The instance in which disagreements are most likely to occur will, however, form but a small percentage of the whole,

* Papers and Reports of the American Public Health Association, vol. xxxii, Part 1.

and will not necessitate the great amount of work which at first thought might seem to be prohibitive. The great majority of cases will fall naturally into their proper assignment, and joint causes will be found to originate the largest number of disagreements. Here, again, a Manual of Classification, dealing with a uniform preference in such cases, will still further reduce the number of such requiring mutual consideration. When agreements on the arrangements of tables and titles and assignments to titles have been accomplished, it naturally follows that aggregates will correspond, and that uniformity as to totals for sex, age periods, nativity, etc., will present no difficulties.

When mortality rates based upon population are to be used in the several publications, then there should be a further agreement upon the population to be used as a basis for these calculations. Discrepancies in the estimated populations of intercensal years for various cities and States as made by the Census Office, in comparison with those employed by local authorities, are very prominent, and in many instances the divergence is so great that rates are seriously affected.

From a popular standpoint the use of rates rather than the actual totals seems to be growing in constant favor for purposes of comparison, and, in order that these comparisons shall not become misleading, it is necessary that the subject of population, not only in the aggregates, but in its component parts, be given serious and mutual consideration by registration officers.

There is nothing impossible in the whole proposition, either as it refers to the National and various State bureaus or to the State and Municipal bureaus. It simply requires a close sympathy in the work of the several offices.

The present system, with uniformity the exception rather than the rule, reflects discreditably not only upon statistics and statistical methods in general, but upon statisticians who, while ostensibly journeying along the same road towards the same objective point, all seem to arrive at different destinations.

With the primary object of registration already successfully promoted in a large territory, there should certainly be a determined effort to make our National Vital Statistics the epitome of accuracy, and to this end there should be a co-ordination that would show National, State, and Municipal statistics to be part of one organic system, with uniformity in detail, treatment, and conclusions.

THE MORTALITY FROM CONSUMPTION IN SMALL CITIES.

By Frederick S. Crum.

The main purpose in this paper is to point out some of the many ways in which the registrars of vital statistics in small cities may render valuable service by making careful and detailed studies of local conditions as reflected in the mortality returns. I have purposely chosen small cities, first, because they have been long neglected, and heretofore attention has been directed almost wholly to the large cities, and, secondly, because the small cities often afford quite exceptional opportunities for the study of certain phenomena in the field of vital statistics, which, because of the size of the population and the large variety of conflicting influences, are rarely, if ever, afforded by the great cities. In the past there has been one very good reason why the small cities have received little attention from the students and investigators of vital statistics in this country. Until very recently, with certain important exceptions, the necessary data have not been available for small cities. This excuse, however, can no longer be offered, for the permanent Bureau of the Census, in its annual reports on mortality, has already compiled much valuable material for nearly three hundred cities of less than 50,000 population, and this information is now available for the six-year period 1900–05.

I hope and expect to see additions and improvements continually made in these mortality statistics, as they appear from year to year, but these expectations are to be realized only by the further extension of the registration area, by the incorporation in the reports of certain important additional details, and by the hearty co-operation of the local registrars throughout the country with the Division of Vital Statistics of the Bureau of the Census.

That the small city often affords exceptional opportunities for the study of the effects which various factors have upon the health and longevity of population, I shall hope to prove convincingly in the course of my argument. Suffice it now to say that any one, two, or more influences which may powerfully affect the health or mortality of a given population can best be isolated in a city of moderate size. An occupation or trade, for example, which is centred in a city of 10,000 population, is more readily studied in its effect upon the health of the men and women engaged therein than would be possible if the same numbers were employed in a city of 500,000 or 1,000,000 population. In the

first place the facts pertaining to the health and mortality of the employees are more readily ascertainable in the small city, and, secondly, the influences of environment, such as latitude, climate, housing conditions, habits, etc., can be weighed better in small than in large cities.

For the basis of this study I have taken 209 registration cities, all but two of which, Pueblo, Col., and Sacramento, Cal., had an estimated population of less than 30,000 in 1905. Pueblo and Sacramento had less than 31,000 population, and they were included because they illustrate certain more or less typical facts. The cities selected may be considered fairly representative of their class for Northern and Western States. They are scattered over the country from Maine to California and from Wisconsin to Florida, but the Southern States are not well represented for the reason that the registration area is as yet very limited there and at the present time embraces only a comparatively few cities. The New England States, New York, New Jersey, Pennsylvania, Ohio, Indiana, Illinois, Michigan, Wisconsin, and California contain the larger part of the small cities here considered, but other States, including Iowa, Kansas, Colorado, Minnesota, Kentucky, Maryland, Virginia, North Carolina, and Florida, are each represented by from one to three cities.

The mortality from consumption has been compiled for each of the 209 cities for the five-year period 1901–05. The original data for single years are to be found in the two census volumes,—"Mortality, 1900 to 1904" and "Mortality, 1905." The average annual mortality rates from consumption were found to vary from 426.7 per 100,000 of population in San Diego, Cal., to 21.4 in Leadville, Col., and the comparative rates, when arranged in the order of size, at once suggested that the differences might be largely accounted for by local differences in the age, sex, race, and nativity distribution of the populations, or by the peculiar physical or climatic features of the cities. Other pronounced factors, such as occupation, the presence in a city of a large institution for the care of the aged, hospitals for the insane, institutions for the treatment of consumptives, or a prison, or the reputation of the city as a health resort, have suggested possible explanations of the heavy mortality from consumption in certain cities. Obviously, the local registrar or health officer in a small city is in a position accurately to weigh and determine the importance of any or all of these factors which make for a high or low death-rate from consumption. By careful and detailed analysis of the population and the death returns the local registrar could often suggest why the death-rates from particular causes were high, and we have no doubt but that if the facts, when unfavorable, were properly presented, it would often be possible to secure immediate improvement in the local conditions responsible for the high mortality.

The general impression that tuberculosis is chiefly a disease of large cities is a false one, for it requires no very extended investigation to prove that, in proportion to population, a considerable number of our smaller towns and cities have relatively high death-rates from consumption, much higher, in fact, than the average for all cities, or for the larger cities combined, or for certain of the largest cities, such as New York, Philadelphia, and Chicago. The average death-rate from consumption in New York City during 1901–05 was 215.8 per 100,000 of population, but this average rate was exceeded in twenty-eight of the 209 small cities; in Philadelphia the average rate was 212.8, and this was exceeded in thirty-one of the small cities; and in Chicago the rate was 156.2, and this was exceeded in no less than eighty-five of the 209 cities here under consideration, and, in fact, the average rate for the 209 small cities combined was slightly higher than the Chicago rate.

The aggregate population exposed on the average one year to the risk of death during 1901–05 in the 209 small cities was 16,453,012. The average annual mortality rate from consumption was 157.6 per 100,000 of population, which compares with 191.5 for the population in the other larger cities of the registration area and 126.5 for the population in the rural parts of the registration States. The comparative figures are given in detail in the following summary table:—

MORTALITY FROM CONSUMPTION IN THE REGISTRATION AREA OF THE UNITED STATES, 1901–05.

Registration Area.	Population.	Mortality from Consumption.	
		Deaths.	Rates per 100,000.
The registration area	162,631,038	276,257	169.9
Cities with less than 30,000 population	16,453,012	25,927	157.6
Cities with more than 30,000 population	99,860,221	191,238	191.5
Rural part of registration States	46,317,805	58,572	126.5

In other words, the death-rate from consumption in the small cities was 21.0 per cent. higher than in the rural districts and 21.5 per cent. lower than in the cities with over 30,000 population. If the same average rate had prevailed in the small cities as in the rural districts, there would have been an aggregate saving or prolonging of 5,445 lives from death by consumption during the five years, or an average saving of 1,089 lives per year. On the other hand, if the same rate had prevailed in the small as in the large cities, there would have been an additional

loss of life over that actually reported of 5,527 during the five years, or an average of 1,115 per year. These illustrations show that the small cities, in the aggregate, in respect of their mortality rates from consumption stand about half-way between the cities with over 30,000 population and the rural districts.

There is abundant evidence that the mortality from consumption is abnormally high in certain rural districts, and it is an open question whether a death-rate from consumption above fifty per 100,000 of population is not excessive for either the city or country. In two of the small cities—Leadville, Col., and Plymouth, Pa.—the average annual rates during 1901–05 were less than fifty, or 21.4 and 29.4 respectively. For several other cities the rate fell below fifty during one or more of the years of the five-year period, and in no less than thirty of the 209 cities the average rate was less than 100.0 per 100,000 of population.

It is of interest to note that, if the average annual death-rate from consumption were 50.0 per 100,000 of population, there would be at the present time an annual saving or prolonging of approximately 3,540 lives in the 209 cities here under consideration, an annual saving of about 40,000 lives in the whole registration area, and an annual saving of well over 100,000 lives in the continental United States. I need hardly add that this possible ideal is certainly well worth all the labor and expense necessary for its attainment.

In the five-year period 1901–05 there has been a noticeable decline in the death-rate from consumption, when the cities are considered in the aggregate, and, as shown in the following table, the rate has declined from 170.0 in 1901 to 151.3 in 1905:—

MORTALITY FROM CONSUMPTION IN 209 SMALL CITIES IN THE REGISTRATION AREA OF THE UNITED STATES, 1901–05.

Year.	Population.	Number of Deaths.	Deaths per 100,000 of Population.
1901	3,166,949	5,383	170.0
1902	3,228,206	5,094	157.8
1903	3,291,585	4,864	147.8
1904	3,352,970	5,420	161.6
1905	3,413,302	5,166	151.3
1901–05	16,453,012	25,927	153.8

Considering the cities individually I find that 84 had a higher and 125 a lower death-rate from consumption in 1905 than in 1901. The general tendency of the rate seems, therefore, to have been downward, but the decline in the mortality from consumption may be expected to continue even more rapidly in the future, for undoubtedly the rate is at present at least three times as high as it should be.

The mortality from consumption in a particular locality is sometimes materially affected by the age distribution of the population. From the census of 1900 we learn that, while the death-rate from this cause was only 44.1 per 100,000 of population at ages under fifteen, the rate was 278.2 at ages sixty-five and over. Any abnormal age distribution of the population, such as a large or small proportion of persons at the very young or very old ages, would therefore materially affect the general death-rate from consumption. It is impossible to give details of the age distribution of the population of the small cities, as the facts were not reported for cities of less than 25,000 population in the census of 1900. I have, however, been able to calculate the percentage of the population at ages under five for all but eleven cities in Indiana. These original figures are to be found in Table 19 of "Vital Statistics," Part I, United States Census of 1900. I find that the average was 9.5 per cent. for the 209 cities in the aggregate, but that the percentages varied from 17.9 for Ironwood, Mich., and 16.5 for Berlin, N.H., to 6.2 for Ann Arbor, Mich., and 6.4 for Ithaca, N.Y. The low percentages of children in Ann Arbor and Ithaca suggest that the college population in those cities unduly increase the proportion of adults, and in consequence reduce the percentage of children to the total population. In cities such as Lafayette and Marion, Ind., and Leavenworth, Kan., the proportion of persons at advanced ages is unduly large, owing to the presence of institutions for the care and treatment of aged, disabled, and dependent soldiers, and among these the mortality rate from consumption is sufficiently high to materially affect the general rate, and I find that the mortality rate from consumption was 223.8 for Lafayette, Ind., 158.5 for Marion, Ind., and 153.3 for Leavenworth, Kan.* So far as I am able to learn, there are no institutions for the care of children of sufficient importance to materially affect the age distribution of the population of any of the 209 small cities here under consideration.

As regards sex, the available facts seem to indicate that consumption is, on the whole, somewhat more fatal among males than among females. There is good reason to believe, however, that the difference is not due to sex *per se*, but rather to other incidental factors, such as occupation,

* In the various branches of the National Home for Disabled Volunteer Soldiers the average annual death-rate from consumption per 100,000 of inmates was 625.5 during the five years 1900–04.

habits, etc. This assumption finds support in the fact that, while in cities the death-rates are exceptionally unfavorable to the males as compared with the females, in the rural districts the rates are actually higher among the females than among the males. It would carry me too far to go into this subject in any detail, and I will therefore pass it by with the remark that, so far as I have been able to judge, from a somewhat careful analysis of the statistics of the 209 small cities, the factor of sex distribution is one of minor importance in explaining the differences in the death-rates from consumption.

One of the most important factors to be considered in any comparative study of death-rates from consumption is race. This is a factor of special importance in nearly all Southern cities, where a large proportion of the total population are negroes, and in certain of the Northern cities—such as Leavenworth, Kan.; Steelton and Carlisle, Pa.; Montclair, Plainfield, Orange, Morristown, and Bridgeton, N.J.; New Albany and Richmond, Ind.; Ironton, Chillicothe, and Portsmouth, Ohio; Newport, R.I.; Jacksonville, Ill.; and Portsmouth, Ohio—the negro element is of sufficient importance to merit careful inquiry. In the following table the twenty-five cities with the largest proportion of negro population are given in the order of importance of the negro element, together with the general death-rates from consumption:—

TWENTY-FIVE SMALL CITIES WITH OVER FIVE PER CENT. OF NEGRO POPULATION IN 1900.

Cities.	Total Population, 1900.	Negro Population, 1900.	Per Cent. Negroes.	Death-rates from Consumption (1901–05).
Wilmington, N.C.	20,796	10,407	49.61	234.3
Petersburg, Va.	21,810	10,751	49.29	348.5
Lynchburg, Va.	18,891	8,254	43.69	252.0
Raleigh, N.C.	13,643	5,721	41.93	343.0
Annapolis, Md.	8,525	3,002	35.21	331.8
Key West, Fla.	17,114	5,562	32.50	300.9
Alexandria, Va.	14,528	4,533	31.20	259.2
Paducah, Ky.	19,446	5,814	29.90	327.4
Frederick, Md.	9,296	1,535	16.51	270.1
Leavenworth, Kan.	20,735	2,925	14.10	153.3
Steelton, Pa.	12,086	1,508	12.47	164.6
Carlisle, Pa.	9,626	1,148	11.93	183.7
Montclair, N.J.	13,962	1,344	9.63	123.3
Plainfield, N.J.	15,369	1,450	9.43	190.4
New Albany, Ind.	20,628	1,905	9.23	234.6
Orange, N.J.	24,141	1,903	7.88	289.9
Ironton, Ohio	11,868	924	7.79	246.1
Chillicothe, Ohio	12,976	986	7.60	182.5
Newport, R.I.	22,034	1,613	7.32	141.7
Morristown, N.J.	11,267	815	7.23	191.6
Jacksonville, Ill.	15,078	1,818	6.61	237.9
Richmond, Ind.	18,226	1,009	5.54	175.6
Portsmouth, Ohio	17,870	947	5.30	210.4
New Rochelle, N.Y.	14,720	777	5.28	94.9
Bridgeton, N.J.	13,913	701	5 04	160.1
Total for 209 cities	3,099,286	110,560	3.57	157.6

All but four of the twenty-five cities had a death-rate from consumption in excess of the average for the 209 cities combined, and the rate was considerably in excess in the nine Southern cities, in all of which the negro element constituted over fifteen per cent. of the total population in 1900. In Wilmington, N.C., and Lynchburg, Va., the negroes were nearly one-half of the total population, and in the nine Southern cities combined the negroes represented 38.6 per cent. of the total population.

From all the reliable data available it appears that consumption is much more prevalent and fatal among negroes than among the white population, and this is true in the North as well as in the South. According to the census of 1900 the average mortality rate from consumption among the negro population in the registration area was 485.4 per 100,000 of population against a rate of only 173.5 for the white

element of the population, or the mortality from consumption among the negroes was 180.0 per cent. in excess of that for the white population. The mortality from consumption among negroes is excessive at all ages, and, when the negro element forms any considerable part of the total population of a given locality, the mortality returns should make distinction of color or race and the death-rates should be separately calculated, otherwise the mortality record will be incomplete and the death-rates are likely to be of little value, if not positively misleading.

The vital statistics of the negro is a subject of great social importance, and there is no valid reason why much better and more determining data should not long since have been available to students of the subject. For three of the nine small cities with a large proportion of negro population the local health reports give the returns with distinction of color and principal causes of death. The State biennial health reports of North Carolina contain the data for Raleigh and Wilmington, and the city health reports give the same information for Petersburg, Va. As a rule, however, there is a lamentable lack of interest shown in this important subject.

In the Tenth Biennial Report of the State Board of Health of North Carolina (1903–04) we find the following statement (p. 87): "The scourge of the colored race remains tuberculosis. . . . The death-rate from consumption in the two races is as 1 to 2.6. With slight variation this proportion has been quite constant for years." In another portion of the report (p. 67) there is reprinted a letter which was sent by the Secretary of the Board of Health to all colored teachers in North Carolina, urging them to take an active part in the work of educating their race in the methods of prevention. From that letter I quote the following: "Pulmonary tuberculosis, or consumption, as it is commonly called, has come to be the bane of the colored race. It is the most fatal of all diseases to every race, but it is especially so among the colored people, being nearly three times as fatal to them as to the whites. It is, therefore, especially important to your people that every effort should be made to check the ravages of this dreadful disease. Being a contagious disease, it can be prevented by following carefully the directions which are fully set forth in the pamphlet on the subject issued by the State Board of Health, a copy of which is enclosed."

The local reports for Petersburg, Va., show that during 1901–05 the mortality rate from consumption for the negroes was 403.6 per 100,000 of population, and for the white population the rate was 247.8. Making due allowance for the presence in Petersburg of the Central Hospital for the Insane with an average population of about 1,000, among whom the mortality from consumption is presumably in excess of that in the

outside population, I still am convinced that the rate of 247.8 for the white population is far above what should constitute a normal rate. The local registrar or health officer could undoubtedly throw considerable light upon the facts if he were so disposed, but there is not a line of comment upon the facts in any of the reports which have come to my notice.

In Lynchburg, Va., the returns are not given with distinction of color, but in the report of the Board of Health for 1902 I find the following comment:—

"The mortality among the colored race continues to exceed that of the white by almost one-third, which we attribute to their mode of living and want of cleanliness. We have used our best efforts to induce them to lead a more cleanly and sanitary life, but they still disregard our injunctions and continue in filth and dissipation of all sorts. Many, however, live a cleanly, sanitary, and respectable life, and the superior healthfulness of this class is very manifest, and proves the importance of this mode of life.

"Most of the houses of the white population have been kept in good sanitary condition, but it is not so in regard to the colored population. Many of their homes are in an unsightly and unhealthy condition, which is manifested by the greater number of deaths among them than among the whites and the better class of their race."

There is abundant opportunity for valuable contributions to our knowledge of the vital statistics of the negro, and the local registrars are the proper authorities to perform this service. As already pointed out, several of the small Northern cities contain enough negroes to make it well worth while to report their mortality separately, and, until this is done, it will be impossible to judge fairly of the relative healthfulness of such cities as Montclair, Morristown, and Orange, N.J., Carlisle, Pa., New Albany, Ind., Ironton, Ohio, or Newport, R.I.

It is important also to know what effect a high death-rate from consumption among the negro element has upon the death-rate of the white population, and this question cannot be definitely answered without fuller information.*

* Of course there are other factors besides negro population that are favorable to a high mortality rate from consumption in some of the Southern cities. Low altitude, humid climate, made ground, and unhealthful occupations are met with in the South as well as in the North. In Key West, Fla., for example, in addition to the large negro population, there are a considerable number of Cubans who seem to be more subject to consumption than native Americans. In Key West, also, the cigar and cigarette industry is the leading employment, some two thousand or more wage-earners being employed. Cigar and cigarette makers are subject to a heavy mortality from consumption, and the death-rates from tuberculosis are excessive at all ages.

In Florida the State Board of Health has long been engaged in an anti-spitting cru-

The mortality from consumption among the Chinese, Japanese, and Indians, is also excessive as compared with the white population. According to the census of 1900 the rates per 100,000 of population were 656.8 for the Chinese, 239.6 for the Japanese, and 506.8 for the Indians in the registration area. Of course, these rates are unfavorably affected by the fact of an unduly high proportion of adults, but this unfavorable age distribution is a general characteristic, particularly of the Chinese and Japanese, in this country, and therefore operates to increase the general death-rate from consumption wherever these races are present in large numbers. The Chinese are of sufficient importance in certain cities in California to materially affect the local death-rates. In Fresno in 1900 the Chinese constituted 8.9 per cent. of the total population; in Sacramento, 3.6 per cent.; in San José, 2.6 per cent.; in Alameda, 1.8 per cent.; and in San Diego, 1.7 per cent. In addition to the comparatively large Chinese population the Japanese in Fresno formed 1.4 per cent. of the total population, and in Sacramento 1.2 per cent. In four of these California cities the mortality from consumption during 1901–05 was comparatively high, being 426.7 for San Diego, 285.9 for Sacramento, 261.8 for San José, and 251.4 for Fresno.

The local registrars in small cities where there are Chinese and Japanese in comparatively large numbers could render a valuable public and social service by reporting the mortality among these classes in detail by age, sex, and causes of death. In the monthly health reports of San Diego and Sacramento the total deaths are reported with distinction of the four races,—Caucasian, African, Mongolian, and Indian,—but no details are given under this classification for age, sex, or causes of death. Precedents have been established, however, in the larger cities of San Francisco and Los Angeles, where the annual health reports show the principal causes of death with distinction of race. In San Francisco

sade. In the Sixteenth Annual Report of that body (1905) the statement was made that "the rule is generally adopted in the cigar factories in Key West that spitting on the floor, or in any place but in a cuspidor, warrants a discharge of the operator. Each table in the cigar manufacturing room is supplied with a cuspidor which the cigar maker is compelled to use. The Ruy Lopez factory at Key West was the first to adopt this cleanly method, in compliance with the State Board's request, and the practice is now universally adopted by all other manufacturers. The innovation upon former uncleanly methods of promiscuous expectoration on the floors was resisted at first, but a little firmness, combined with kindly persuasion and explanation, overcame all objections, and it is now thought that the operatives themselves would be decidedly unwilling to return to former uncleanly habits."

These facts are of interest as indicating the practical utility of local statistics of sickness and mortality in any similar effort to bring about sanitary reforms in any particular industry or locality. Employers and employees are usually open to suggestions for sanitary reforms if the suggestions are accompanied by reliable facts which indicate the strong probability of improved health when the reforms shall have been effected.

during the year 1905 there were 118 deaths from consumption among the Chinese, or equivalent to a rate of 1,207 per 100,000 of population, or over 12 per 1,000 of population, assuming that the Chinese were of the same proportionate strength in the population in 1905 as in 1900 and that the total population increased at the same rate during 1900–05 as during the intercensal decade 1890–1900. In Los Angeles during 1901–05 there were 101 deaths from consumption among the Chinese and Japanese, these races not being separated in the returns. We have no way of determining the exact number of the Chinese and Japanese exposed on the average one year to the risk of death, but, if we assume that the percentage of these elements to the total population in Los Angeles during 1901–05 remained approximately the same as in 1900, the death-rate from consumption was over 1,100 per 100,000, or more than 11 per 1,000 of population. It is of the utmost importance to know with more certainty what the death-rates from consumption is among the Chinese and Japanese in this country. If the actual conditions are as bad as they appear to be from the fragmentary data now available, it behooves the health or other responsible authorities to make the facts known, so that drastic measures may be taken to restrict the spread of the disease from these danger spots and so far as possible to eradicate the sources of infection by a more rigid enforcement of the health and sanitary laws among these elements of the population.

Among the foreign born the mortality from consumption is often very heavy, and the rate varies considerably among the different nativities. According to the census of 1900, at ages 15–44, the average rate per 100,000 of population was 428.0 for persons of Irish birth, 235.2 for Bohemians, 233.7 for Scandinavians, 220.6 for the French, 205.9 for Germans, 201.1 for the Scotch, and 199.7 for Canadians. For the white population of native birth the rate was only 162.5 at ages 15–44. It would carry me too far to go into the subject of nativity in its relation to consumption in any detail, but the facts stated indicate that in any locality with a large proportion of persons of foreign birth the crude death-rate from consumption is likely to be considerably higher than in another locality, similar in other respects, but with a population practically all of native birth.*

The physical characteristics of a locality often exert a considerable influence upon the general death-rate, and, as a rule, the death-rate from

* The foreign-born element in the total population ranged from 1.8 per cent. in Carlisle, Pa., to 58.4 per cent. in Chicopee, Mass. There were eleven cities with more than 40.0 per cent. of foreign-born population, and ninety-seven with more than 20 per cent. In any valuable analysis of the mortality from consumption in its relation to nativity it would be necessary to know the relative importance of the various nativities in any particular locality. These facts are not obtainable in the census of 1900 for cities of less than 25,000 population.

certain causes of death, such as malaria, typhoid fever, consumption, and respiratory diseases, reflect more clearly than others the influence upon health of climate, latitude, and topography, including altitude, natural drainage, character of the soil, etc. Obviously, it would require more time and space than I have at my command to discuss all of these factors as they are illustrated in the mortality from consumption in the 209 cities with which I am at present concerned. Thanks to the good work of the United States Geological Survey and the Bureau of Soils of the Department of Agriculture, the facts of topography are rapidly becoming available, and the soil survey reports especially should be of great value to sanitarians, health officials, and physicians.

I shall attempt here to deal briefly with only one topographic fact in its relation to the mortality from consumption. We now know with approximate accuracy the altitude of practically every place of importance in the United States, and the facts are available in the Dictionary of Altitudes, compiled by Mr. Henry Gannett, United States Geographer. When more than one elevation is given, I have taken the average as probably best representing the true altitude of the city as a whole. For Ithaca, N.Y., for example, four observations are reported in the Dictionary of Altitudes. The extremes are 381 feet at the water surface of Cayuga Lake and 836 feet at the Weather Bureau, which is the Civil Engineering Building on the Cornell University Campus. The altitude, or elevation, is given for two other intermediate points, and the average of the four elevations is 611 feet, which perhaps represents as nearly as possible the average altitude of the city as a whole, a considerable part of which is built on east, south, and west hills. For certain New England *towns* the elevation given for the principal city in the town has been taken as the best approximation for the town as a whole. In considering this factor of altitude, I have discarded the nine cities with over fifteen per cent. of negro population, and arranged the remaining 200 cities in eleven groups, the first group including cities of less than 100 feet elevation, the second of from 100 to 199 feet, the third of from 200 to 299 feet, and so on to the last group, which includes all the cities at an altitude of 1,000 feet or more. The following table gives the facts in detail, including a summary statement of the mortality in three larger groups of cities, those with altitudes of less than 500 feet, with altitudes of from 500 to 1,000 feet, and with altitudes over 1,000 feet:—

MORTALITY FROM CONSUMPTION IN 200 SMALL CITIES OF THE REGISTRATION AREA, 1901–05.

(Cities Arranged by Altitude.)

Altitude in Feet.	Number of Cities.	Aggregate Population.	Number of Deaths.	Deaths per 100,000.
Under 100 feet	53	4,400,522	7,452	169.4
100–199	18	1,568,465	2,657	169.4
200–299	14	981,723	1,604	163.4
300–399	5	342,391	560	163.6
400–499	16	971,312	1,555	160.1
500–599	25	2,121,306	2,943	138.8
600–699	20	1,463,528	1,988	135.8
700–799	16	1,127,495	1,537	136.3
800–899	10	984,112	1,299	132.0
900–999	6	519,232	664	127.9
1,000 and over	17	1,215,641	1,434	117.9
Under 500 ft.	106	8,264,413	13,828	167.3
500–999	77	6,215,673	8,431	135.7
1,000 and over	17	1,215,641	1,434	117.9
Total	200	15,695,727	23,693	151.0

The statistics show that there is a close relation between altitude and mortality from consumption, and the death-rates decline with quite remarkable regularity as the altitude increases. There are many disturbing factors, such as health resorts, occupations, etc., which operate to offset the favorable influence of altitude, but notwithstanding these the table shows that the effect of elevation is strong enough to make itself felt in the death-rates when the populations are sufficiently large to give a fair average. Some cities with comparatively high altitudes have relatively high mortality rates from consumption, but in such cases there is always a disturbing factor of sufficient importance to outweigh the favorable effect of altitude, and it is safe to assume that the rates would be higher if the cities were at appreciably lower altitudes.

The effect of altitude upon the mortality from consumption is perhaps best shown by grouping the cities into two equal or nearly equal divisions in such States as are sufficiently well represented to make such a classification possible. The result of this method is shown in the following table:—

MORTALITY FROM CONSUMPTION IN SMALL CITIES, 1901–05.

(Cities Arranged by Altitude and by States.)

States.	Altitude.	Number of Cities.	Population.	Number of Deaths.	Deaths per 100,000 of Population.
Connecticut	Under 100 ft.	9	735,935	1,230	167.1
	Over 100 ft.	7	429,385	667	155.3
Indiana	Under 700 ft.	10	685,679	1,304	190.2
	Over 700 ft.	9	749,305	1,199	160.0
Massachusetts	Under 100 ft.	20	1,602,356	2,280	142.3
	Over 100 ft.	17	1,134,418	1,672	147.4
Michigan	Under 750 ft.	9	595,017	625	105.0
	Over 750 ft.	8	609,001	586	96.2
New Hampshire. . .	Under 250 ft.	4	291,375	507	174.0
	Over 250 ft.	4	242,890	319	131.3
New Jersey	Under 100 ft.	5	407,663	560	137.4
	Over 100 ft.	6	490,272	928	189.3
New York	Under 450 ft.	14	1,292,870	2,302	178.1
	Over 450 ft.	14	1,071,727	1,199	111.9
Ohio	Under 700 ft.	8	594,100	986	166.0
	Over 700 ft.	5	428,412	611	142.6
Pennsylvania	Under 600 ft.	8	656,146	977	148.9
	Over 600 ft.	7	477,978	384	80.3
Wisconsin	Under 700 ft.	3	246,152	308	125.1
	Over 700 ft.	4	352,078	419	119.0

This table requires no extended comment. It is quite clearly shown that altitude is an important factor in any consideration of the comparative mortality from consumption in small cities. The differences in the rates for cities of low as compared with cities of relatively high elevations are too pronounced to admit of any doubt as to the salutary effect of high altitude, and the statistics confirm the general opinion that low ground and a generally damp or humid atmosphere increase the liability to consumption, while high ground and a generally dry and rarefied atmosphere are favorable to a low mortality from tuberculosis. In Massachusetts and New Jersey the rates for the cities located at relatively high altitudes are higher than for the cities of low elevation, but these apparent exceptions are the result of other important factors, such as occupation, which affect the rates sufficiently to more than balance the favorable effect of the higher elevations.

That consumption is a frequent cause of death in institutions, such as almshouses, insane asylums, and prisons, is a fact well known to all who are familiar with the mortality returns of such institutions. During a twelve-year period the average annual mortality from consumption in four representative State hospitals for the insane * was 805.0 per 100,000 of inmates exposed on the average one year. These statistics show a progressive improvement in the sanitary conditions, however, and the rate during the last six years of the period was 701.3 as compared with 923.6 during the first six years.

In seven representative State prisons † the mortality rate from consumption during twelve years averaged 605.0 per 100,000 of inmates. In these institutions, in the aggregate, the rate declined from 760.3 during the first six years to 549.8 during the last six years. Whenever a large almshouse, prison, insane asylum, soldiers' home, or other institution for the more or less permanent care or treatment of the adult and aged, is found in a small city, the general death-rate from consumption is almost certain to be appreciably affected by its presence.

In Ogdensburg, N.Y., there is a large State hospital for the insane, and the death-rate from consumption for that city was 291.3 during 1901–05; in Danvers, Mass., there is also a large hospital for the insane, and the rate was 284.6; in Norristown, Pa., there is located a State hospital for the insane, with a yearly average of nearly 2,500 patients, and the rate was 275.6; in Middletown, Conn., there is a State hospital for the insane, and the rate was 254.3; and in Jacksonville, Ill., which contains the Central Hospital for the Insane, with an average of about 1,500 patients, the general death-rate from consumption was 237.9. We might go further with our illustrations, but they will occur to any one, and those given will suffice for the present purpose.

It is self-evident that, if a city contains a large hospital for the special treatment of consumptives or a general hospital to which are attracted a considerable number of non-resident, consumptive patients, the death-rate from consumption is likely to be appreciably affected. So far as I have been able to discover, there are no such institutions in the 209 cities with which I am dealing, or at least there is none of sufficient importance to materially affect either the general death-rate or the death-rate from consumption. There are, however, certain cities which, because of their fame as health resorts, attract invalids, including consumptives, from all parts of the United States. Among these are San Diego, San José and Sacramento, Cal., Pueblo, Col., and Saratoga

* New Jersey State Hospital, Central Hospital, Illinois, State Hospital, Utica, N.Y., State Hospital, Wisconsin, 1891–1902.

† Sacramento, Cal., Joliet, Ill., Charlestown, Mass., Philadelphia, Pa., Columbus, Ohio, Ossining, N.Y., and Clinton State Prison, New York, 1891–1902.

Springs, N.Y. All of these cities have excessively high mortality rates from consumption. The rates in the California cities are also unfavorably affected by the Chinese element, as has previously been pointed out, and, largely as a result of the two factors, San Diego heads the list of the 209 small cities, with a rate of 426.7. Pueblo is fourth, with a rate of 338.1, and it is second, if we exclude the two cities of Petersburg, Va., and Raleigh, N.C., where the negro element is a predominating factor. The high rate of 211.5 for Saratoga Springs is clearly the effect of the large invalid non-resident population.

It would materially increase our knowledge and serve a very practical and useful purpose if the local registrars would make careful note of the mortality by causes in the important institutions within their respective jurisdictions, and in cities like Pueblo, Col., and Saratoga Springs, N.Y., the deaths of the non-resident population should be distinguished from the deaths of the resident population. It would be desirable to have this distinction made in all cities, but it is of special importance in cities where there are large numbers of non-resident invalid persons. There can be no question of doubt but that the presence of a large number of pulmonary invalids scattered throughout a city, itself normally comparatively free from the disease, must constitute a menace to the health of the resident population. There can be no doubt but that there is a gradual spread of infection where pulmonary invalids are permitted to live in boarding-houses or hotels without a most careful medical supervision, and there is probably no stronger argument in favor of sanatoria for the treatment of incipient or advanced cases of consumption than the fact that without supervision and control the disease is spread from the infected to the uninfected, and localities formerly almost free from consumption finally become a menace to the health of the local population. The importance of these facts can only become generally known by a more adequate presentation and analysis of the mortality by the local registrars.

Certain occupations have a marked effect upon the health and mortality of those employed therein. This general fact was established long ago, but much still remains to be done before sufficient data will be available to make it possible to get at the real facts of health and longevity as affected by the various trades and occupations. There is a dearth of material in this country along these lines, and this is particularly unfortunate, because we cannot be guided by English or European experience in these matters, for the conditions here are generally very different from those which obtain in the older countries. There is not a single city in the United States which has published trade mortality statistics in the excellent manner in which this has been done in the health reports of Blackburn and Sheffield, England. There are

some fragmentary data available in certain local reports of this country, of which I may mention the Registration Reports of Rhode Island and the State Health Reports of Vermont. But, generally speaking, no emphasis whatever has been placed upon this important phase of vital statistics in this country, and this is the more remarkable because of the many excellent opportunities for good work along these lines in many of our small cities where important and more or less health-injurious trades are centred.* The information relating to mortality by occupations compiled in the Eleventh and Twelfth Censuses of the United States are good so far as they go, but they do not go far enough to serve the most useful and practical purposes. The terms are too general, and the groupings are either too large or too indefinite to permit of accurate conclusions as to the relative healthfulness of specific employments. We cannot expect a census to yield the most important results along these lines of inquiry. The census should give the facts as to the number of employees, but the local registrars or health officers must furnish the necessary details as to age, sex, and causes of death among the employees in at least the more important industries centred in their respective cities.

Of all the diseases affected by occupation, the one most generally affected is consumption. This disease is more common among employees in dusty trades than in trades free from dust; and it is more frequent among persons engaged in sedentary employments, such as book-keeping, than among persons, like farmers, who live an outdoor life of manual labor. There seems to be little doubt but that the mortality rate from consumption in small cities is materially affected by certain predisposing occupations which, in several instances, are sufficiently prominent to be an important factor in the mortality. The mortality rate from consumption in Orange, N.J., was 289.9 as compared with the average of 151.0 for the 200 cities (excluding the nine cities with large negro populations), or the rate of Orange represented an ex-

* In the introduction to that very useful work, "The Hygiene, Diseases, and Mortality of Occupations," Dr. J. T. Arlidge, in reviewing the history and sources of the materials which he had been able to gather, remarks: "One source of the information sought might fairly be looked for in the reports issued by the medical officers of health in the various towns, but, so far as these documents have fallen under my notice, they have proved barren. It is, to my mind, an indication that the importance of noting industrial diseases and estimating their influence on the public health and mortality has not as yet been recognized. The reports of Dr. Sinclair White, formerly medical officer of health at Sheffield, constituted a noteworthy exception. He presented special memoranda on the health of Sheffield artisans. His successor in that town, Dr. Theodore Thomson, followed his example during the time he held office." Dr. Arlidge's book was published in 1892, and the good work at Blackburn was only in its beginning. The Blackburn reports have proven to be for the cotton-mill operatives what the Sheffield reports have been for the file and cutlery artisans. Both have served a very useful purpose in helping to bring about notable improvements in the conditions of employment, and these in turn have resulted in a reduction of the death-rates compared with those which formerly prevailed.

cess over the average of 138.9 per 100,000 of population. A considerable part of this excess was undoubtedly the result of employment in the felt-hat industry. The making of felt hats is generally recognized to be a health-injurious trade, and the mortality from consumption and respiratory diseases among hatters is high at all ages. In 1905 there were 1,379 employees engaged in the felt-hat industry in Orange,—a number sufficiently large in proportion to the total population to quite materially affect the local death-rate.

In Barre, Vt., the average annual mortality rate from consumption during 1901–05 was 205.4 per 100,000 of population, or an excess above the average of 54.4. This city is at an altitude of 515 feet in the hill section of Northern Vermont, where the general health and sanitary conditions are excellent. But the stone-cutting industry is centred at Barre, and in this industry there is an extraordinary prevalence of consumption. The biennial reports of the State Board of Health of Vermont show that in Washington County during the six years 1900–05 there were 137 deaths of stone-cutters, 66, or 46.7 per cent. of which, were due to consumption, and 20, or 15.3 per cent., were due to respiratory diseases. We do not know how many persons are employed at stone-cutting in Barre, but it is the principal employment, and the local physicians distinctly recognize what they designate as "stone-cutters' consumption."

Amsterdam, Cohoes, and Middletown, N.Y., are centres for the manufacture of hosiery and knit goods, and it would be an important addition to our knowledge of the vital statistics of knitting-mill employees if the facts were available, showing their mortality in detail.

In several other small cities in New England, New York, New Jersey, and Pennsylvania, textile trades are of local importance. In New England the cotton mills employ thousands of men and women; in Jamestown, N.Y., nearly 2,000 are employed in worsted mills; and in Norristown, Pa., nearly 1,500 are employed in knitting and woollen mills. The health officers or local registrars in these cities should make themselves familiar with the health reports of Blackburn, England, which for nearly twenty years have contained the detail mortality statistics of cotton-mill operatives. That the Blackburn returns have been of great benefit is testified to by employers, employees, factory inspectors, and all those who are familiar with British factory legislation and the reduction in mortality effected thereby, particularly among cotton weavers.

In the coal mining towns and cities and in the metal mining centres detailed statistics of mortality from diseases among miners are urgently needed to supplement the data showing deaths by accident. Among the 209 small cities there are several which contain a large proportion of

coal or metal miners. There seems to be a considerable difference in the mortality from consumption among coal miners as compared with metal miners, including iron, copper, lead and zinc, and the precious metals. This is what we would theoretically expect, but it is one thing to know, in a general way, that there is a difference, and it is quite another and more important thing to know exactly what the difference is from reliable local returns. The registrars or health officers in such cities as Mahanoy City, Carbondale, and Hazleton, Pa., and Iron Mountain, Ironwood, and Ishpeming, Mich., could render an extremely valuable service along this line if only they were so disposed.

In nearly all of the small cities there are one or more occupations for which additional information as to health conditions and mortality would serve a very useful and practical purpose. For example, there are trolley systems in nearly all of the cities, and it is of importance to know the relative mortality from consumption among the street-car conductors and motormen compared with the general population of approximately the same ages. From the viewpoint of public hygiene this information would serve a highly useful purpose.

Among other important occupations met with in all cities, and with more or less excessive death-rates from consumption, I may mention bakers and printers. It is a matter of the greatest concern to the bread and cake eating public that the bakeries be made as cleanly, well ventilated, and generally healthful as possible. If the bakers in any given city are dying from consumption in such numbers as to indicate bad conditions in their bake-shops, the facts should be made known, and it is the imperative duty of the registrars of vital statistics to see to it that the relation between cause and effect is made public, so that proper pressure may be brought to bear to bring about the necessary improvements. Health officers should be co-workers and in entire harmony with the factory inspectors in these matters.

That the mortality from consumption among printers is excessive is quite generally known, but, if there were more reliable statistics of their mortality by causes and by age, the data would serve a useful purpose in any effort, by legislation or otherwise, to improve the conditions in printing establishments. In this connection we may call attention to a note on the health of printers in the *Bulletin of the Department of Labor* of New York for June, 1907. A special report on the "Health of Printers" will appear also in the forthcoming Twenty-fourth Annual Report of the Bureau of Labor Statistics of New York.

I do not need to add further details at the present time. I think that the facts presented are sufficient to prove that the opportunities for useful contributions to our knowledge of vital statistics which are open to health officers and registrars in the small cities of this country are

quite as numerous and important as in the large cities. What are needed most at the present time are men with the ambition and talent, patience and industry, to dig out the facts from the mines of information which lie everywhere about them.

Addison, in his remarkable essay entitled "The Visions of Mirzah," depicted the span of life from birth to death, as a more or less dilapidated bridge leading across a chasm through which raged a turbulent and destructive tide. The crossing of this bridge was represented to be at best a hazardous undertaking, and, of the many who found themselves on the approach, comparatively few succeeded in reaching the far extremity. We may carry this simile a little farther, and liken the registrars of vital statistics to the life-bridge inspectors. It is their peculiar privilege and imperative duty to make careful and diligent inquiry into all the facts of mortality, and to point out, when necessary, the weak points and hidden pitfalls in the bridge which require strengthening and repair. It is their business to see to it that as many as possible of all those who once get on the bridge may succeed in crossing it safely. Their work will be successful only in so far as they report the facts of mortality in sufficient detail to make possible the accurate location of the places which require repair.

I trust that I have succeeded in indicating a few of the ways in which good and much-needed work can be performed by the collectors and custodians of death certificates in our small cities. The work to be done requires that the position of health officer or registrar of vital statistics shall be a more permanent one than is possible if it is to continue to be the football of politics. It is difficult to imagine a more important work than that intrusted to health officers. Upon their efficiency largely depends the health of the community, than which nothing is of greater importance. When we awake to a full realization of this fact, we may hope to see the health officers of this country holding their positions solely because of their fitness, and then, and not until then, can we expect to get the best information from the local mortality records, and be in a position more fully to understand all the complicated facts relating to the health and longevity of our population through all its progress over the hundred more or less broken arches of the bridge of human life.

TABLE I.

MORTALITY FROM CONSUMPTION IN 209 SMALL CITIES OF THE UNITED STATES, 1901–05.

Cities.	Population (1901–05).	Deaths from Consumption.		Deaths from All Causes.		Per Cent. of Total Deaths due to Consumption.
		Number.	Rates. per 100,000 Population.	Number.	Rates. per 1,000 Population	
Adams (town), Mass.	59,723	100	167.4	998	16.7	10.0
Alameda, Cal.	90,270	114	126.3	1,235	13.7	9.2
Alexandria, Va.	72,925	189	259.2	1,616	22.2	11.7
Amesbury (town), Mass.	45,469	81	178.1	745	16.4	10.9
Amsterdam, N.Y.	115,381	170	147.3	1,784	15.5	9.5
Anderson, Ind.	115,050	200	173.8	1,543	13.4	13.0
Ann Arbor, Mich.	72,881	71	97.4	1,116	15.3	6.4
Annapolis, Md.	44,005	146	331.8	921	20.9	15.9
Ansonia, Conn.	66,915	103	153.9	949	14.2	10.8
Appleton, Wis.	81,170	94	115.8	932	11.5	10.1
Arlington (town), Mass.	46,210	60	129.8	557	12.1	10.7
Ashtabula, Ohio	70,910	80	112.8	1,074	15.1	7.5
Attleboro (town), Mass.	60,773	89	146.4	811	13.3	11.0
Augusta, Me.	60,155	97	161.3	1,428	23.7	6.8
Aurora, Ill.	127,425	142	111.4	1,674	13.1	8.5
Bangor, Me.	113,375	197	173.8	2,026	17.9	9.7
Barre, Vt.	48,690	100	205.4	697	14.3	14.4
Bath, Me.	55,010	85	154.5	825	15.0	10.3
Battle Creek, Mich.	106,501	125	117.4	1,695	15 9	7.4
Bellaire, Ohio	49,560	77	155.4	975	19.7	7.9
Belleville, Ill.	90,600	126	139.1	1,544	17.0	8.2
Beloit, Wis.	59,435	85	143.0	787	13.2	10.8
Bennington, Vt.	42,625	57	133.7	658	15.4	8.7
Berlin, N.H.	52,170	44	84.3	759	14.5	5.8
Beverly, Mass.	73,435	101	137.5	1,057	14.4	9.5
Biddeford, Me.	83,275	154	184.9	1,587	19.1	9.7
Bridgeton, N.J.	68,700	110	160.1	1,007	14.7	10.9
Bristol (town), Conn.	51,605	58	112.4	782	15.2	7.4
Brookline (town), Mass.	110,176	89	80.8	1,650	10.9	7.4
Burlington, Iowa	122,353	166	135.7	1,664	13.6	10.0
Burlington, Vt.	99,275	131	132.0	1,828	18 4	7.2
Carbondale, Pa.	71,280	61	85.6	1,261	17.7	4.8
Carlisle, Pa.	51,145	94	183.7	802	15.7	11.7
Central Falls, R.I.	94,670	146	154.2	1,570	16.6	9.3
Chicopee, Mass.	98,905	153	154.7	1,837	18.6	8.3
Chillicothe, Ohio	67,415	123	182.5	1,048	15.5	11.8
Clinton (town), Mass.	66,652	72	108.0	1,062	15.9	6.8
Cohoes, N.Y.	120,006	265	220.8	2,345	19.5	11.3
Columbia, Pa.	64,310	63	98.0	930	14.5	6.8
Columbus, Ind.	42,765	101	236.2	670	15 7	15.0

TABLE I.—*Continued.*

Cities.	Population (1901–05).	Deaths from Consumption.		Deaths from all Causes.		Per Cent. of Total Deaths due to Consumption.
		Number.	Rates. per 100,000 Population.	Number.	Rates. per 1,000 Population.	
Concord, N.H.	102,105	147	144.0	1,740	17.0	8.4
Corning, N.Y.	62,433	75	120.1	909	14.6	8.2
Cortland, N.Y.	51,610	38	73.6	637	12.3	6.0
Danbury (town), Conn.	97,370	181	185.9	1,615	16.6	11.2
Danvers (town), Mass.	44,271	126	284.6	1,205	27.2	10.5
Decatur, Ill.	110,787	153	138.1	1,528	13.8	10.0
Dover, N.H.	66,665	110	165.0	1,150	17.3	9.5
Dubois, Pa.	51,720	28	54.1	747	14.4	3.8
Dunkirk, N.Y.	68,821	56	81.4	1,105	16.1	5.1
Eau Claire, Wis.	91,245	120	131.5	1,033	11.3	11.6
Elkhart, Ind.	81,775	117	143.1	1,020	12.5	11.4
Elwood, Ind.	80,455	87	108.1	827	10.3	10.5
Escanaba, Mich.	53,552	90	166.2	1,003	18.7	8.9
Everett, Mass.	136,005	221	162.5	1,841	13.5	12.0
Findlay, Ohio	88,065	134	152.2	1,091	12.4	12.3
Flint, Mich.	72,692	67	92.0	1,020	14.0	6.6
Framingham (town), Mass.	57,246	58	101.3	850	14.8	6.9
Frederick, Md.	48,130	130	270.1	1,059	22.0	12.3
Fresno, Cal.	64,825	163	251.4	1,295	20.0	12.6
Gardner (town), Mass.	57,660	73	126.6	865	15.0	8.4
Geneva, N.Y.	57,346	48	83.7	808	14.1	5.9
Glens Falls, N.Y.	69,173	97	140.2	1,058	15.3	9.2
Gloucester, Mass.	130,275	187	143.5	2,274	17.5	8.2
Gloversville, N.Y.	92,430	100	108.2	1,283	13.9	7.8
Green Bay, Wis.	105,930	129	121.8	1,466	13.8	8.8
Greenwich (town), Conn.	63,920	74	115.8	1,026	16.1	7.2
Hamilton, Ohio	128,960	192	148.9	1,850	14.3	10.4
Hammond, Ind.	71,330	77	107.9	1,041	14.6	7.4
Harrison, N.J.	59,658	106	177.7	1,083	18.2	9.8
Hazleton, Pa.	75,285	67	89.0	1,095	14.5	6.1
Hudson, N.Y.	50,146	92	183.5	948	18.9	9.7
Huntington, Ind.	50,630	84	165.9	678	13.4	12.4
Hyde Park (town), Mass.	70,016	105	150.0	918	13.1	11.5
Iron Mountain, Mich.	43,748	47	107.4	637	14.6	7.4
Ironton, Ohio	60,135	148	246.1	1,003	16.7	14.7
Ironwood, Mich.	49,701	38	76.5	707	14.2	5.4
Ishpeming, Mich.	60,155	78	129.7	815	13.5	9.6
Ithaca, N.Y.	69,760	91	130.4	1,087	15.6	8.4
Jackson, Mich.	126,350	128	101.3	1,826	14.5	7.0
Jacksonville, Ill.	78,600	187	237.9	1,721	21.9	10.9
Jamestown, N.Y.	123,796	134	108.2	1,485	12.0	9.0
Jeffersonville, Ind.	54,035	138	255.4	1,063	19.7	13.0
Johnstown, N.Y.	49,555	52	104.9	661	13.3	7.9
Keene, N.H.	48,405	60	124.0	738	15.2	8.2
Key West, Fla.	95,720	288	300.9	2,079	21.7	13.9

TABLE I.—*Continued.*

Cities.	Population (1901–05).	Deaths from Consumption.		Deaths from all Causes.		Per Cent. of Total Deaths due to Consumption
		Number.	Rates. per 100,000 Population.	Number.	Rates. per 1,000 Population.	
Kingston, N.Y.	125,300	242	193.1	2,204	17.6	11.0
Kokomo, Ind.	56,570	114	201.5	896	15.8	12.7
Laconia, N.H.	40,210	68	169.1	744	18.5	9.1
Lafayette, Ind.	93,385	209	223.8	1,656	17.7	12.6
Lansing, Mich.	96,640	55	56.9	1,170	12.1	4.7
Leadville, Col.	65,380	14	21.4	1,149	17.6	1.2
Leavenworth, Kan.	111,549	171	153.3	1,646	14.8	10.4
Leominster (town), Mass.	67,675	87	128.6	870	12.9	10.0
Lima, Ohio	126,127	198	157.0	1,778	14.1	11.1
Lockport, N.Y.	85,443	116	135.8	1,329	15.6	8.7
Logansport, Ind.	85,340	161	188.7	1,491	17.5	10.8
Lynchburg, Va.	106,750	269	252.0	2,199	20.6	12.2
Madison, Wis.	110,228	120	108.9	1,172	10.6	10.2
Mahanoy City, Pa.	70,850	40	56.3	1,549	21.9	2.6
Manchester (town), Conn.	56,575	84	148.5	684	12.1	12.2
Manitowoc, Wis.	61,768	97	157.0	813	13.2	11.9
Mankato, Minn.	54,183	75	138.4	743	13.7	10.1
Marietta, Ohio	74,360	85	114.3	992	13.3	8.6
Marinette, Wis.	78,454	82	104.5	917	11.7	8.9
Marion, Ind.	103,491	164	158.5	1,363	13.2	12.0
Marlboro, Mass.	69,435	101	145.5	996	14.3	10.2
Marquette, Mich.	52,565	75	142.7	798	15.2	9.4
Massillon, Ohio	62,495	56	89.6	748	12.0	7.5
Meadville, Pa.	54.618	43	78.7	783	14.3	5.5
Medford, Mass.	95,543	111	116.2	1,193	12.5	9.3
Melrose, Mass.	68,806	84	122.1	875	12.7	9.6
Menominee, Mich.	57,634	52	90.2	749	13.0	6.9
Michigan City, Ind.	80,355	99	123.2	1,044	13.0	9.5
Middletown, N.Y.	76,090	147	193.2	1,465	19.3	10.0
Middletown, Ohio	46,300	78	168.5	595	12.9	13.1
Middletown (town), Conn.	90,850	231	254.3	1,850	20.4	12.5
Milford (town), Mass.	59,065	81	137.1	872	14.8	9.3
Millville, N.J.	56,816	77	135.5	820	14.4	9.4
Montclair, N.J.	77,031	95	123.3	1,353	17.6	7.0
Morristown, N.J.	58,970	113	191.6	1,090	18.5	10.4
Mt. Carmel, Pa.	73,290	59	80.5	1,330	18.1	4.4
Mt. Vernon, N.Y.	117,243	135	115.1	1,659	14.2	8.1
Muncie, Ind.	120,969	196	162.0	1,830	15.1	10.7
Muscatine, Ia.	73,405	60	81.7	959	13.1	6.2
Muskegon, Mich.	104,385	106	101.5	1,308	12.5	8.1
Nashua, N.H.	126,375	206	162.2	1,998	15.8	10.3
Natick (town), Mass.	47,801	75	156.9	704	14.7	10 7
Naugatuck, Conn.	59,185	99	167.3	818	13.8	12.1
New Albany, Ind.	103,140	242	234.6	1,786	17.3	13.6
New Brunswick, N.J.	109,408	181	165.4	2,018	18.4	9.0

TABLE I.—*Continued.*

Cities.	Population (1901–05).	Deaths from Consumption.		Deaths from All Causes.		Per Cent. of Total Deaths due to Consumption.
		Number.	Rates. per 100,000 Population.	Number.	Rates. per 1,000 Population.	
New London, Conn.	93,425	186	199.1	1,795	19.2	10.4
New Rochelle, N.Y.	90,598	86	94.9	1,226	13.5	7.0
Newark, Ohio	96,620	136	140.8	1,409	14.6	9.6
Newburg, N.Y.	128,840	286	221.9	2,408	18.7	11.9
Newburyport, Mass.	72,978	111	152.1	1,392	19.1	8.0
Newport, Ky.	146,575	256	174.7	2,319	15.8	11.1
Newport, R.I.	119,996	170	141.7	1,909	15.9	8.9
Niagara Falls, N.Y.	118,210	118	99.8	1,918	16.2	6.2
Norristown, Pa.	115,030	317	275.6	2,819	24.5	11.2
North Adams Mass.	114,850	166	144.5	1,794	15.6	9.3
Northampton, Mass.	97,155	125	128.7	1,548	15.9	8.1
Norwalk (town), Conn.	102,945	157	152.5	1,580	15.3	10.0
Norwich (town), Conn.	125,570	202	160.9	2,220	17.7	9.1
Ogdensburg, N.Y.	73,806	215	291.3	1,720	23.3	12.5
Olean, N.Y.	49,158	27	54.9	565	11.5	4.8
Orange, N.J.	126,585	367	289.9	2,551	20.2	14.4
Ottawa, Ill.	54,440	67	123.1	710	13.0	9.5
Owosso, Mich.	45,162	37	81.9	441	9.8	8.4
Paducah, Ky.	104,775	343	327.4	2,269	21.7	15.1
Peabody (town), Mass.	62,340	85	136.3	876	14.1	9.7
Peekskill, N.Y.	60,313	101	167.5	1,069	17.7	9.5
Perth Amboy, N.J.	113,081	86	76.1	1,463	12.9	5.9
Peru, Ind.	54,885	65	118.4	649	11.8	10.0
Petersburg, Va.	109,050	381	348.5	2,877	26.4	13.2
Phillipsburg, N.J.	60,160	63	104.7	781	13.0	8.1
Pittsfield, Mass.	118,535	147	124.0	1,871	15.8	7.8
Plainfield, N.J.	86,140	164	190.4	1,375	16.0	11.9
Plymouth, Pa.	74,710	22	29.4	1,143	15.3	1.9
Plymouth (town), Mass.	52,538	61	116.1	745	14.2	8.2
Pontiac, Mich.	53,025	44	83.0	926	17.5	4.7
Port Huron, Mich.	99,051	55	55.5	1,262	12.7	4.4
Port Jervis, N.Y.	47,855	83	173.4	829	17.3	10.0
Portsmouth, N.H.	54,400	93	171.0	976	17.9	9.6
Portsmouth, Ohio	96,460	203	210.4	1,478	15.3	13.7
Pottstown, Pa.	69,095	108	156.3	1,049	15.2	10.3
Pottsville, Pa.	80,935	86	106.3	1,448	17.9	5.9
Poughkeepsie, N.Y.	123,493	199	161.1	2,256	18.3	8.8
Pueblo, Col.	146,685	496	338.1	3,853	26.3	12.9
Quincy, Mass.	132,023	187	141.6	1,808	13.7	10.3
Raleigh, N.C.	69,670	239	343.0	1,695	24.3	14.1
Revere (town), Mass.	58,765	63	107.2	736	12.5	8.6
Richmond, Ind.	93,960	165	175.6	1,556	16.6	10.6
Rochester, N.H.	43,935	98	223.1	691	15.7	14.2
Rockland, Me.	40,750	87	213.5	771	18.9	11.3
Rome, N.Y.	82,671	151	182.7	1,436	17.4	10.5

TABLE I.—*Continued.*

Cities.	Population (1901–05).	Deaths from Consumption.		Deaths from all Causes.		Per Cent of Total Deaths due to Consumption.
		Number.	Rates. per 100,000 Population.	Number.	Rates. per 1,000 Population.	
Rutland, Vt.	58,650	90	153.5	1,080	18.4	8.3
Sacramento, Cal.	150,760	431	285.9	3,075	20.4	14.0
San Diego, Cal.	92,100	393	426.7	2,066	22.4	19.0
San José, Cal.	112,660	295	261.8	1,809	16.1	16.3
Saratoga Springs, N.Y.	63,815	135	211.5	1,374	21.5	9.8
Sault Ste. Marie, Mich.	56,080	55	97.9	1,006	17.9	5.5
South Bethlehem, Pa.	70,615	96	135.9	1,112	15.7	8.7
Southbridge (town), Mass.	53,050	73	137.6	882	16.6	8.3
Stamford (town), Conn.	98,905	155	156.7	1,968	19.9	7.9
Steelton, Pa.	65,011	107	164.6	1,096	16.9	9.7
Stonington (town), Conn.	44,740	67	149.8	752	16.8	8.9
Tiffin, Ohio	55,105	87	157.9	742	13.5	11.7
Torrington (town), Conn.	71,880	91	126.6	836	11.6	10.9
Traverse City, Mich.	53,896	88	163.3	985	18.3	8.9
Union, N.J.	81,386	126	154.8	1,358	16.7	9.3
Vernon (town), Conn.	41,920	45	107.3	591	14.1	7.6
Vincennes, Ind.	53,954	112	207.6	938	17.4	11.9
Wabash, Ind.	46,405	72	155.2	543	11.7	13.2
Wakefield (town), Mass.	49,381	90	182.3	649	13.1	13.9
Wallingford (town), Conn.	48,635	55	113.1	623	12.8	8.8
Waltham, Mass.	125,806	182	144.7	1,722	13.7	10.5
Ware (town), Mass.	42,306	78	184.4	647	15.3	12.1
Washington, Ind.	46,490	100	215.1	648	13.9	15.5
Watertown, N.Y.	119,220	114	95.6	1,772	14.9	6.4
Watertown (town), Mass.	53,183	60	112.8	651	12.2	9.2
Watervliet, N.Y.	72,085	128	177.6	1,207	16.7	10.6
Webster (town), Mass.	47,660	63	132.2	739	15.5	8.5
Westfield (town), Mass.	65,451	94	143.6	1,073	16.4	8.8
Weymouth (town), Mass.	57,401	87	151.6	850	14.8	10.2
Williamsport, Pa.	146,230	170	116.3	2,055	14.1	8.2
Wilmington, N.C.	106,260	249	234.3	2,873	27.0	8.7
Windham (town), Conn.	50,850	109	214.4	917	18.0	11.9
Winona, Minn.	100,430	107	106.5	1,241	12.4	8.6
Woburn, Mass.	71,711	126	175.7	1,086	15.1	11.6
Total (209 cities)	16,453,012	25,927	157.6	264,071	16.1	9.8

TABLE II.

PERCENTAGE OF CHILDREN AND NEGROES IN 209 SMALL CITIES OF THE UNITED STATES AND ALTITUDE OF THE CITIES.

(*Census of* 1900.)

Cities.	Total Population.	Children (Ages 0–4).		Negroes.		Altitude in Feet.
		Number.	Per Cent.	Number.	Per Cent.	
Adams (town), Mass.	11,134	1,303	11.7	18	0.16	799
Alameda, Cal.	16,464	1,336	8.1	144	1.00	12
Alexandria, Va.	14,528	1,439	9.9	4,533	31.20	50
Amesbury (town), Mass.	9,473	848	9.0	23	0.24	26
Amsterdam, N.Y.	20,929	2,044	9.8	94	0.45	275
Anderson, Ind.	20,178	(?)	(?)	680	3.37	875
Ann Arbor, Mich.	14,509	893	6.2	359	2.47	791
Annapolis, Md.	8,525	782	9.2	3,002	35.21	16
Ansonia, Conn.	12,681	1,624	12.8	501	3.95	31
Appleton, Wis.	15,085	1,846	12.2	18	0.12	714
Arlington (town), Mass.	8,603	961	11.2	75	0.87	46
Ashtabula, Ohio	12,949	1,685	13.0	75	0.58	654
Attleboro (town), Mass.	11,335	1,023	9.0	111	0.98	133
Augusta, Me.	11,683	1,034	8.8	51	0.44	47
Aurora, Ill.	24,147	2,395	9.9	211	0.87	661
Bangor, Me.	21,850	1,831	8.4	176	0.81	21
Barre, Vt.	8,448	1,095	13.0	3	0.00	515
Bath, Me.	10,477	967	9.2	40	0.38	7
Battle Creek, Mich.	18,563	1,426	7.7	527	2.84	820
Bellaire, Ohio	9,912	1,081	10.9	428	4.32	670
Belleville, Ill.	17,484	1,835	10.5	230	1.32	502
Beloit, Wis.	10,436	978	9.4	66	0.63	745
Bennington (town), Vt.	8,033	710	8.8	38	0.67	726
Berlin, N.H.	8,886	1,465	16.5	—	—	1,013
Beverly, Mass.	13,884	1,215	8.8	50	0.36	23
Biddeford, Me.	16,145	1,762	10.9	1	0.00	75
Bridgeton, N.J.	13,913	1,249	9.0	701	5.04	42
Bristol, Conn.	9,643	997	10.3	19	0.30	332
Brookline (town), Mass.	19,935	1,650	8.3	161	0.81	10
Burlington, Ia.	23,201	2,031	8.8	403	1.74	502
Burlington, Vt.	18,640	1,781	9.6	115	0.62	190
Carbondale, Pa.	13,536	1,525	11.3	4	0.00	1,078
Carlisle, Pa.	9,626	786	8.2	1,148	11.93	469
Central Falls City, R.I.	18,167	2,214	12.2	62	0.34	88
Chicopee, Mass.	19,167	2,481	12.9	10	0.00	84
Chillicothe, Ohio	12,976	1,123	8.7	986	7.60	632
Clinton (town), Mass.	13,667	1,462	10.7	24	0.18	262
Cohoes, N.Y.	23,910	2,228	9.3	15	0.00	155
Columbia, Pa.	12,316	1,395	11.3	421	3.42	255
Columbus, Ind.	8,130	753	9.3	224	2.76	631
Concord, N.H.	19,632	1,677	8.5	58	0.30	264
Corning, N.Y.	11,061	1,078	9.7	119	1.07	937
Cortland, N.Y.	9,014	695	7.7	51	0.57	1,125

TABLE II.—*Continued.*

Cities.	Total Population.	Children (Ages 0–4).		Negroes.		Altitude in Feet.
		Number.	Per Cent.	Number.	Per Cent.	
Danbury (town), Conn.	19,477	1,717	8.8	241	1.46	371
Danvers (town), Mass.	8,542	706	8.3	10	0.11	42
Decatur, Ill.	20,754	2,004	9.7	620	2.99	679
Dover, N.H.	13,207	1,150	8.7	15	0.11	77
Dubois, Pa.	9,375	1,317	14.0	24	0.26	1,399
Dunkirk, N.Y.	11,616	1,401	12.0	10	0.09	613
Eau Claire, Wis.	17,517	2,013	11.5	11	0.06	776
Elkhart, Ind.	15,184	(?)	(?)	35	0.24	754
Elwood, Ind.	12,950	(?)	(?)	5	0.00	860
Escanaba, Mich.	9,549	1,262	13.2	25	0.26	597
Everett, Mass.	24,336	2,850	11.7	634	2.61	12
Findlay, Ohio	17,613	1,634	9.3	294	1.67	780
Flint, Mich.	13,103	857	6.5	257	1.96	716
Framingham (town), Mass.	11,302	954	8.4	38	0.33	180
Frederick, Md.	9,296	927	10.0	1,535	16.51	271
Fresno, Cal.	12,470	1,052	8.4	291	2.33	287
Gardner (town), Mass.	10,813	1,185	11.0	53	0.49	1,030
Geneva, N.Y.	10,433	877	8.4	193	1.85	471
Glens Falls, N.Y.	12,613	1,095	8.7	33	0.26	279
Gloucester, Mass.	26,121	2,622	10.0	39	0.15	52
Gloversville, N.Y.	18,349	1,268	6.9	216	1.18	821
Green Bay, Wis.	18,684	2,418	12.9	33	0.18	604
Greenwich (town), Conn.	12,172	1,337	11.0	356	2.92	28
Hamilton, Ohio	23,914	2,458	10.3	347	1.45	597
Hammond, Ind.	12,376	(?)	(?)	17	0.14	593
Harrison, N.J.	10,596	1,293	12.2	49	0.46	38
Hazleton, Pa.	14,230	1,794	12.6	14	0.10	1,624
Hudson, N.Y.	9,528	664	7.0	424	4.45	67
Huntington, Ind.	9,491	(?)	(?)	8	0.08	742
Hyde Park (town), Mass.	13,244	1,313	9.9	116	0.87	59
Iron Mountain, Mich.	9,242	1,510	16.3	5	0.00	1,160
Ironton, Ohio	11,868	1,169	9.8	924	7.79	529
Ironwood, Mich.	9,705	1,733	17.9	1	0.00	1,500
Ishpeming, Mich	13,255	1,918	14.5	—	—	1,434
Ithaca, N.Y.	13,136	836	6.4	364	2.77	611
Jackson, Mich.	25,180	1,951	7.7	473	1.88	942
Jacksonville, Ill.	15,078	1,026	6.8	997	6.61	603
Jamestown, N.Y.	22,892	2,134	9.3	77	0.34	1,323
Jeffersonville, Ind.	10,774	1,063	9.9	1,818	1.69	451
Johnstown, N.Y.	10,130	796	7.9	108	1.07	650
Keene, N.H.	9,165	781	8.5	5	0.00	497
Key West, Fla.	17,114	2,141	12.5	5,562	32.50	22
Kingston, N.Y.	24,535	2,233	9.1	545	2.22	197
Kokomo, Ind.	10,609	(?)	(?)	359	3.38	806
Laconia, N.H.	8,042	643	8.0	21	0.26	507
Lafayette, Ind.	18,116	1,483	8.2	344	1.90	577
Lansing, Mich.	16,485	1,302	7.9	323	1.96	843

TABLE II.—*Continued.*

Cities.	Total Population.	Children (Ages 0–4).		Negroes.		Altitude in Feet.
		Number.	Per Cent.	Number.	Per Cent.	
Leadville, Col.	12,455	1,140	9.2	195	1.57	10,187
Leavenworth, Kan.	20,735	1,994	9.6	2,925	14.10	780
Leominster (town), Mass.	12,392	1,142	9.2	75	0.61	404
Lima, Ohio	21,723	2,378	10.9	731	3.37	876
Lockport, N.Y.	16,581	1,466	8.8	160	0.96	541
Logansport, Ind.	16,204	(?)	(?)	167	1.03	597
Lynchburg, Va.	18,891	1,964	10.4	8,254	43.69	607
Madison, Wis.	19,164	1,703	8.9	69	0.36	888
Mahanoy City, Pa.	13,504	1,952	14.5	4	0.00	1,236
Manchester (town), Conn.	10,601	1,153	10.9	43	0.41	177
Manitowoc, Wis.	11,786	1,472	12.5	3	0.59	595
Mankato, Minn.	10,599	1,100	10.4	7	0.00	775
Marietta, Ohio	13,348	1,213	9.1	361	2.70	618
Marinette, Wis.	16,195	2,310	14.3	1	0.00	597
Marion, Ind.	17,337	(?)	(?)	650	3.74	812
Marlboro, Mass.	13,609	1,243	9.1	31	0.23	375
Marquette, Mich.	10,058	1,197	11.9	62	0.42	642
Massillon, Ohio	11,944	1,236	10.3	83	0.69	975
Meadville, Pa.	10,291	774	7.5	173	1.68	1,078
Medford, Mass.	18,244	1,870	10.3	244	1.34	13
Melrose, Mass.	12,962	1,204	9.3	130	1.00	59
Menominee, Mich.	12,818	1,930	15.1	—	—	594
Michigan City, Ind.	14,850	1,634	11.0	197	1.33	608
Middletown, N.Y.	14,522	1,107	7.6	380	2.62	631
Middletown, Ohio	9,215	902	9.8	314	3.41	664
Middletown (town), Conn.	17,486	1,469	8.4	127	1.33	55
Milford (town), Mass.	11,376	1,035	9.1	24	0.21	266
Millville, N.J.	10,583	1,062	10.0	139	1.31	35
Montclair, N.J.	13,962	1,341	9.6	1,344	9.63	241
Morristown, N.J.	11,267	1,075	9.5	815	7.23	372
Mt. Carmel, Pa.	13,179	2,153	16.3	10	0.08	1,056
Mt. Vernon, N.Y.	21,228	2,538	12.0	516	2.43	114
Muncie, Ind.	20,942	2,004	9.6	739	3.53	945
Muscatine, Ia.	14,073	1,436	10.2	125	0.89	547
Muskegon, Mich.	20,818	2,078	10.0	23	0.11	599
Nashua, N.H.	23,898	2,550	10.7	62	0.26	138
Natick (town), Mass.	9,488	838	8.8	52	0.55	164
Naugatuck, Conn.	10,541	1,426	13.5	31	0.29	194
New Albany, Ind.	20,628	(?)	(?)	1,905	9.23	442
New Brunswick, N.J.	20,006	1,890	9.4	755	3.77	61
New London, Conn.	17,548	1,571	9.0	378	2.15	27
New Rochelle, N.Y.	14,720	1,826	12.4	777	5.28	72
Newark, Ohio	18,157	1,774	9.8	300	1.65	822
Newburg, N.Y.	24,943	2,230	8.9	558	2.24	69
Newburyport, Mass.	14,478	1,243	8.6	97	0.67	39
Newport, Ky.	28,301	2,806	9.9	424	1.50	507
Newport, R.I.	22,034	2,109	9.6	1,613	7.32	25

TABLE II.—*Continued.*

Cities.	Total Population.	Children (Ages 0–4).		Negroes.		Altitude in Feet.
		Number.	Per Cent.	Number.	Per Cent.	
Niagara Falls, N.Y.	19,457	1,945	10.0	344	1.77	578
Norristown, Pa.	22,265	1,749	7.9	728	3.27	83
North Adams, Mass.	24,200	2,896	12.0	90	0.37	706
Northampton, Mass.	18,643	1,623	8.7	108	0.58	124
Norwalk (town), Conn.	19,932	1,810	9.1	189	3.09	28
Norwich (town), Conn.	24,637	2,316	9.4	544	3.15	33
Ogdensburg, N.Y.	12,633	1,261	10.0	23	0.18	276
Olean, N.Y.	9,462	867	9.2	122	1.29	1,435
Orange, N.J.	24,141	2,754	11.4	1,903	7.88	184
Ottawa, Ill.	10,588	998	9.4	34	0.32	496
Owosso, Mich.	8,696	694	8.0	22	0.25	740
Paducah, Ky.	19,446	1,846	9.5	5,814	29.90	344
Peabody (town), Mass.	11,523	1,194	10.4	38	0.33	19
Peekskill, N.Y.	10,358	1,007	9.7	243	2.34	11
Perth Amboy, N.J.	17,699	2,620	14.8	89	0.50	55
Peru, Ind.	8,463	765	9.0	67	0.79	643
Petersburg, Va.	21,810	2,195	10.1	10,751	49.29	58
Phillipsburg, N.J.	10,052	914	9.1	36	0.36	207
Pittsfield, Mass.	21,766	2,023	9.3	277	1.27	1,026
Plainfield, N.J.	15,369	1,461	9.5	1,450	9.43	102
Plymouth, Pa.	13,649	1,990	14.5	25	0.18	535
Plymouth (town), Mass.	9,592	968	10.1	146	1.52	38
Pontiac, Mich.	9,769	784	8.0	151	1.55	933
Port Huron, Mich.	19,158	1,741	9.1	69	0.36	596
Port Jervis, N.Y.	9,385	842	9.0	119	1.27	451
Portsmouth, N.H.	10,637	891	8.4	101	0.94	14
Portsmouth, Ohio.	17,870	1,773	9.9	947	5.30	507
Pottstown, Pa.	13,696	1,428	10.4	292	2.13	144
Pottsville, Pa.	15,710	1,526	9.7	168	1.07	618
Poughkeepsie, N.Y.	24,209	1,926	8.0	623	2.59	138
Pueblo, Col.	28,157	2,851	10.1	1,213	4.31	4,669
Quincy, Mass.	23,899	2,780	11.6	27	0.11	40
Raleigh, N.C.	13,643	1,458	10.7	5,721	41.93	352
Revere (town), Mass.	10,395	1,170	11.2	43	0.41	16
Richmond, Ind.	18,226	1,403	7.7	1,009	5.54	958
Rochester, N.H.	8,466	823	9.7	3	0.00	229
Rockland, Me.	8,150	564	6.9	31	0.38	(?)
Rome, N.Y.	15,343	1,369	8.9	89	0.58	436
Rutland, Vt.	11,499	1,007	8.7	54	0.47	562
Sacramento, Cal.	29,282	2,130	7.3	402	1.37	30
San Diego, Cal.	17,700	1,247	7.0	313	1.77	30
San José, Cal.	21,500	1,480	6.9	209	0.97	98
Saratoga Springs, N.Y.	12,409	987	7.9	619	4.99	294
Sault Ste. Marie, Mich.	10,538	1,170	11.1	22	0.21	608
South Bethlehem, Pa.	13,241	1,676	12.7	115	0.87	239
Southbridge (town), Mass.	10,025	1,160	11.6	29	0.29	490
Stamford (town), Conn.	18,839	1,872	9.9	256	1.60	34

TABLE II.—*Continued.*

Cities.	Total Population.	Children (Ages 0–4).		Negroes.		Altitude in Feet.
		Number.	Per Cent.	Number.	Per Cent.	
Steelton, Pa.	12,086	1,296	10.7	1,508	12.47	308
Stonington (town), Conn.	8,540	871	10.2	141	1.65	7
Tiffin, Ohio	10,989	913	8.3	44	0.40	753
Torrington (town), Conn.	12,453	1,614	13.0	67	0.80	593
Traverse City, Mich.	9,407	837	8.9	8	0.09	599
Union, N.J.	15,187	1,895	12.5	7	0.00	140
Vernon (town), Conn.	8,483	795	9.4	28	0.38	407
Vincennes, Ind.	10,249	949	9.3	432	4.21	429
Wabash, Ind.	8,618	(?)	(?)	134	1.55	727
Wakefield (town), Mass.	9,290	884	9.5	25	0.27	102
Wallingford (town), Conn.	9,001	1,033	11.5	21	0.31	75
Waltham, Mass.	23,481	2,023	8.6	51	0.22	79
Ware (town), Mass.	8,263	890	10.8	—	—	488
Washington, Ind.	8,551	(?)	(?)	255	2.98	483
Watertown, N.Y.	21,696	1,876	8.7	75	0.34	454
Watertown (town), Mass.	9,706	931	9.6	53	0.55	19
Watervliet, N.Y.	14,321	1,325	9.3	59	4.12	32
Webster (town), Mass.	8,804	1,141	13.0	32	0.36	440
Westfield (town), Mass.	12,310	1,225	10.0	81	0.66	149
Weymouth (town), Mass.	11,324	955	8.4	40	0.35	30
Williamsport, Pa.	28,757	2,600	9.0	1,142	3.97	525
Wilmington, N.C.	20,796	2,265	10.9	10,407	49.61	52
Windham (town), Conn.	10,137	952	9.4	74	0.83	247
Winona, Minn.	19,714	2,326	11.8	30	0.15	651
Woburn, Mass.	14,254	1,566	11.0	261	1.83	98
Totals	3,099,286	293,246	9.5	104,839	3.57	

TABLE III.

MORTALITY FROM CONSUMPTION IN 209 SMALL CITIES OF THE UNITED STATES, 1901–05.

(*The Cities are arranged in the order of the Death-rates per* 100,000 *of Population.*)

Cities.	Rates.	Cities.	Rates.
San Diego, Cal.	426.7	Paducah, Ky.	327.4
Petersburg, Va.	348.5	Key West, Fla.	300.9
Raleigh, N.C.	343.0	Ogdensburg, N.Y.	291.3
Pueblo, Col.	338.1	Orange, N.J.	289.9
Annapolis, Md.	331.8	Sacramento, Cal.	285.9

TABLE III.—*Continued.*

Cities.	Rates.	Cities.	Rates.
Danvers (town), Mass.	284.6	Peekskill, N.Y.	167.5
Norristown, Pa.	275.6	Adams (town), Mass.	167.4
Frederick, Md.	270.1	Naugatuck, Conn.	167 3
San José, Cal.	261.8	Escanaba, Mich.	166.2
Alexandria, Va.	259.2	Huntington, Ind.	165.9
Jeffersonville, Ind.	255.4	New Brunswick, N.J.	165.4
Middletown (town), Conn.	254.3	Dover, N.H.	165.0
Lynchburg, Va.	252.0	Steelton, Pa.	164.6
Fresno, Cal.	251.4	Traverse City, Mich.	163.3
Ironton, Ohio	246.1	Everett, Mass.	162.5
Jacksonville, Ill.	237.9	Nashua, N.H.	162.2
Columbus, Ind.	236.2	Muncie, Ind.	162.0
New Albany, Ind.	234.6	Augusta, Me.	161.3
Wilmington, N.C.	234.3	Poughkeepsie, N.Y.	161.1
Lafayette, Ind.	223.8	Norwich (town), Conn.	160.9
Rochester, N.H.	223.1	Bridgeton, N.J.	160.1
Newburg, N.Y.	221.9	Marion, Ind.	158.5
Cohoes, N.Y.	220.8	Tiffin, Ohio	157.9
Washington, Ind.	215.1	Lima, Ohio	157.0
Windham (town), Conn.	214.4	Manitowoc, Wis.	157.0
Rockland, Me.	213.5	Natick (town), Mass.	156.9
Saratoga Springs, N.Y.	211.5	Stamford, Conn.	156.7
Portsmouth, Ohio	210.4	Pottstown, Pa.	156.3
Vincennes, Ind.	207.6	Bellaire, Ohio	155.4
Barre, Vt.	205.4	Wabash, Ind.	155.2
Kokomo, Ind.	201.5	Union, N.J.	154.8
New London, Conn.	199.1	Chicopee, Mass.	154.7
Middletown, N.Y.	193.2	Bath, Me.	154.5
Kingston, N.Y.	193.1	Central Falls, R.I.	154.2
Morristown, N.J.	191.6	Ansonia, Conn.	153.9
Plainfield, N.J.	190 4	Rutland, Vt.	153.5
Logansport, Ind.	188.7	Leavenworth, Kan.	153.3
Danbury (town), Conn.	185.9	Norwalk (town), Conn.	152.5
Biddeford, Me.	184.9	Findlay, Ohio	152.2
Ware (town), Mass.	184.4	Newburyport, Mass.	152.1
Carlisle, Pa.	183.7	Weymouth (town), Mass.	151.6
Hudson, N.Y.	183.5	Hyde Park (town), Mass.	150.0
Rome, N.Y.	182.7	Stonington (town), Conn.	149.8
Chillicothe, Ohio	182.5	Hamilton, Ohio	148.9
Wakefield (town), Mass.	182.3	Manchester (town), Conn.	148.5
Amesbury (town), Mass.	178.1	Amsterdam, N.Y.	147.3
Harrison, N.J.	177.7	Attleboro (town), Mass.	146.4
Watervliet, N.Y.	177.6	Marlboro, Mass.	145.5
Woburn, Mass.	175.7	Waltham, Mass.	144.7
Richmond, Ind.	175.6	North Adams, Mass.	144.5
Newport, Ky.	174.7	Concord, N.H.	144.0
Anderson, Ind.	173.8	Westfield (town), Mass.	143.6
Bangor, Me.	173.8	Gloucester, Mass.	143.5
Port Jervis, N.Y.	173.4	Elkhart, Ind.	143.1
Portsmouth, N.H.	171.0	Beloit, Wis.	143.0
Laconia, N.H.	169.1	Marquette, Mich.	142.7
Middletown, Ohio	168.5	Newport, R.I.	141.7

TABLE III.—*Continued.*

Cities.	Rates.	Cities.	Rates.
Quincy, Mass.	141.6	Madison, Wis.	108.9
Newark, Ohio	140.8	Gloversville, N.Y.	108.2
Glens Falls, N.Y.	140.2	Jamestown, N.Y.	108.2
Belleville, Ill.	139.1	Elwood, Ind.	108.1
Mankato, Minn.	138.4	Clinton (town), Mass.	108.0
Decatur, Ill.	138.1	Hammond, Ind.	107.9
Southbridge (town), Mass.	137.6	Iron Mountain, Mich.	107.4
Beverly, Mass.	137.5	Vernon (town), Conn.	107.3
Milford (town), Mass.	137.1	Revere (town), Mass.	107.2
Peabody (town), Mass.	136.3	Winona, Minn.	106.5
South Bethlehem, Pa.	135.9	Pottsville, Pa.	106.3
Lockport, N.Y.	135.8	Johnstown, N.Y.	104.9
Burlington, Ia.	135.7	Phillipsburg, N.J.	104.7
Millville, N.J.	135.5	Marinette, Wis.	104.5
Bennington (town), Vt.	133.7	Muskegon, Mich.	101.5
Webster (town), Mass.	132.2	Framingham (town), Mass.	101.3
Burlington, Vt.	132.0	Jackson, Mich.	101.3
Eau Claire, Wis.	131.5	Niagara Falls, N.Y.	99.8
Ithaca, N.Y.	130.4	Columbia, Pa.	98.0
Arlington (town), Mass.	129.8	Sault Ste. Marie, Mich.	97.9
Ishpeming, Mich.	129.7	Ann Arbor, Mich.	97.4
Northampton, Mass.	128.7	Watertown, N.Y.	95.6
Leominster (town), Mass.	128.6	New Rochelle, N.Y.	94.9
Gardner (town), Mass.	126.6	Flint, Mich.	92.0
Torrington (town), Conn	126.6	Menominee, Mich.	90.2
Alameda, Cal.	126.3	Massillon, Ohio	89.6
Keene, N.H.	124.0	Hazleton, Pa.	89.0
Pittsfield, Mass.	124.0	Carbondale, Pa.	85.6
Montclair, N.J.	123.3	Berlin, N.H.	84.3
Michigan City, Ind.	123.2	Geneva, N.Y.	83.7
Ottawa, Ill.	123.1	Pontiac, Mich.	83.0
Melrose, Mass.	122.1	Owosso, Mich.	81.9
Green Bay, Wis.	121.8	Muscatine, Ia.	81.7
Corning, N.Y.	120.1	Dunkirk, N.Y.	81.4
Peru, Ind.	118.4	Brookline (town), Mass.	80.8
Battle Creek, Mich.	117.4	Mt. Carmel, Pa.	80.5
Williamsport, Pa.	116.3	Meadville, Pa.	78.7
Medford, Mass.	116.2	Ironwood, Mich.	76.5
Plymouth (town), Mass.	116.1	Perth Amboy, N.J.	76.1
Appleton, Wis.	115.8	Cortland, N.Y.	73.6
Greenwich (town), Conn.	115.8	Lansing, Mich.	56.9
Mt. Vernon, N.Y.	115.1	Mahanoy City, Pa.	56.3
Marietta, Ohio	114.3	Port Huron, Mich.	55.5
Wallingford, Conn.	113.1	Olean, N.Y.	54.9
Ashtabula, Ohio	112.8	Dubois, Pa.	54.1
Watertown, Mass.	112.8	Plymouth, Pa.	29.4
Bristol, Conn.	112.4	Leadville, Col.	21.4
Aurora, Ill.	111.4		

DEVELOPMENT OF VITAL STATISTICS.

By Henry D. Holton, A.M., M.D., Secretary, State Board of Health, Vermont.

It is not necessary more than to allude to the fact that Vital Statistics are the basis upon which State and municipal sanitation rest. This was early recognized by the Colonies, as has been pointed out by Chapin. Virginia, in 1631, required that ministers and church wardens should report marriages, births, and deaths. In 1639 the Colony of Massachusetts adopted registration regulations, and seven years later the Plymouth Colony followed its example. Various municipalities required reports of vital statistics. In 1856 the legislature of Vermont placed on the statute book a law requiring the reporting of all marriages, births, and deaths. The school district clerks were required to visit every home in their respective districts in January, and, make careful inquiry as to the number of births and deaths that had occurred in the home during the year previous, and report the same to the town clerk. Ministers and magistrates were also required to report all marriages. The town clerk was to transmit all of these reports to the Secretary of State, who was required to receive the returns, and, with the assistance that might be voluntarily rendered to him by any authorized committee of the Vermont Medical Society, to prepare such tabular results as might render them of practical utility and report thereon to the legislature. This method of registration continued for forty-one years. Imperfect as it was in its methods, valuable data were preserved. In 1898 the registration law at present in operation was passed, although there have been slight amendments made to perfect its operation. No body of a human being can be buried, removed, or cremated, unless the local health officer first issues a permit for that purpose. The physician last in attendance upon a deceased person must immediately fill out a certificate of death, and within thirty-six hours deliver the certificate to the family or undertaker. The blanks for all certificates, under the Act, are furnished by the State Board of Health. The certificate of birth must be made by the physician or head of the family and returned within ten days to the town clerk, who receives and retains in his office, as the permanent record of the office, the certificates of marriages, births, and deaths. He is supplied by the State Board of Health with abstracts sheets on which he must return

semi-annually a copy of each certificate to the Secretary of the State Board of Health. (We hope soon to secure an amendment requiring the returns to the State Board to be made monthly.) The accuracy of the returns by this method is evidenced first, in that the ill-defined causes of death are less by two-thirds than under the former Act; second, in that all deaths are returned, as no body can be buried without a permit based upon the certificate of death.

Regarding the returns of births the case is quite different. The careless physician neglects to return births until the town clerk notifies him of his delinquency, although he receives twenty-five cents for each birth and death certificate returned. I am persuaded that in many instances the doctor who sits down weeks, and perhaps months, after a birth to make up his returns, fails to remember some of them: hence, they do not get reported. There are now only sixteen States that have a similar act requiring all marriages, births, and deaths to be reported. One of the first missions of this Section should be to urge upon the remaining States that they adopt similar laws, to the end that we may have uniformity throughout the nation. Agitation to show the importance of this registration should be continued until every State secures the required legislation.

With the standard required by the Census Bureau we may reasonably expect that this Section will be a very material power in bringing the vital statistics of the whole country much nearer a state of reliability and desired perfection. To this end the International Classification of Causes of Death should be revised during or before 1910.

The sanitarians of the country are to be congratulated upon the success that has attended their labors to improve the hygienic conditions under which we live to-day. The prevention of communicable diseases and the better sanitary conditions surrounding us have made it possible for a much larger number of persons to reach advanced age, although in the middle period of life the mortality from some organic diseases has increased. The "strenuous" life has much to do with the increasing death-rate from both organic heart disease and apoplexy. In short, we need to return to the "simple life," cultivating a broad, unselfish philanthropy in efforts to relieve the unfortunate and distressed, helping them to reach higher planes of mental and moral life, making it possible for them to live in sanitary homes and be surrounded by pleasant, healthy, uplifting influences other than those that tend to physical and moral degradation.

In the small State of Vermont, where there is a greater equality of environment and methods of living than in a large municipality or in States with a greater diversity of general conditions, the vital statistics show more accurately the result of sanitary improvements.

It is interesting to learn from our registration of fifty years just what changes have taken place in this rural commonwealth in the causes of death. We find that in comparing the first registration report, made in 1857, with the last, for 1906, that, taking the deaths from the communicable diseases of typhoid fever, measles, scarlatina, whooping-cough, and tuberculosis in this State, there were in 1857 1,179 deaths or one to every 266 of the inhabitants. In 1906 there were 613, or only one to every 571 of the inhabitants. In 1857 tuberculosis alone caused the death of 848, or one in 370. In 1906 the deaths were 453, only one in 772. Typhoid fever in 1857 caused 169 deaths, one in 1,858. In 1906 there were only 70 deaths, being one in 5,000.

There has been an increase in certain diseases, as there has been throughout the country. In 1857 cancer caused 73 deaths, only one in 4,301 persons. In 1906 it added to the death-roll 287, or one in 1,219. Pneumonia in 1857 led with 163 deaths, or one in 1,926. In 1906 there were 575 deaths, or one in 608. In 1857 organic heart disease destroyed only 125, or one in 2,512 persons. In 1906 there were reported from this cause 577 deaths, or one in 606. Apoplexy in 1857 caused death in 71 cases, or only one in 4,422. In 1906 the number of deaths from this cause was 430, or one in 813.

We also find that in the first period only one person in 754 lived to be eighty years old or over, while in the last period one in every 425 was eighty or over.

The average age at death was, in the first period, 38; in the latter, 48. Fractions have been discarded in the above figures.

From these statistics we must be impressed that our duty in the future is a more rigid enforcement of means calculated to secure the absolute suppression of communicable diseases, with a continued effort in the direction of determining the cause of those diseases which continue, with increasing certainty, to decimate our people during middle life. To this end we would suggest that a committee be appointed to co-operate with a similar committee from the Laboratory Section, with a view to making a special effort to determine the causes of the diseases that our vital statistics indicate are so rapidly on the increase.

THE METHODS EMPLOYED IN MAINE IN CHECKING THE RETURNS OF BIRTHS, MARRIAGES, AND DEATHS.

By Dr. A. G. Young, Secretary, State Board of Health, Augusta, Me.

I preface what I have to say with a statement of some of the provisions of the Maine registration law.

The Secretary of the State Board of Health is *ex-officio* State Registrar of Vital Statistics, and the law provides that he shall enforce its provisions as far as comes within his power, and further provides that, when any penalty or forfeiture has been incurred, he shall put the case into the hands of the proper prosecuting attorney. Births must be reported to the town or city clerk by the physician or midwife within six days of the events. Intentions of marriage must be recorded. No clergyman or justice may solemnize a marriage until he has received a marriage certificate from the hands of the parties to the proposed marriage, and a report of the marriage must be made to the town clerk within six days. When deaths occur, the attending physician must furnish a certificate of the cause of death, but the onus of completing the certificate and obtaining a burial permit is on the undertaker or other person who moves the body or superintends the burial. The obligation is also upon householders to report births and deaths which occur in their houses or families. Until this year annual reports were made by the local clerks to the State Registrar, but beginning with this year a provision for monthly returns of births, marriages, and deaths went into effect.

In Maine the methods in use for checking or controlling and making more nearly complete the returns of births, marriages, and deaths, are the following:—

Births.—The town clerk, when he learns of any birth which has not been reported to him, must collect and record the required facts so far as he is able to do so. For this he receives a special fee. The assessors, when taking the annual inventory in the month of April each year, collect and return to the town clerk the names of children born in the preceding year. The law provides that, when the town clerk makes his returns of births, marriages, and deaths to the State Registrar, he shall report to him the names, residences, and official stations of all persons who have neglected to make returns to him.

We have a system of newspaper clippings applying to marriages and deaths as well as to births. The office of the State Registrar subscribes to several newspapers which are published in different parts of the State, and which give quite full lists of births, marriages, and deaths. All birth, marriage, and death notices found are cut out. These clippings are pasted

upon pieces of manila paper 2 x 4¼ inches in size, sorted in three packages, and stamped with a rubber stamp "birth," "marriage," and "death," respectively. The items are arranged alphabetically under the name of the father of the child for births, of the bridegroom for marriages, and of the person deceased for deaths. A search for duplicates results in throwing out thousands. Those remaining are compared with the card returns of births, marriages, and deaths. This results in eliminating all but about a total of five hundred a year. These five hundred or thereabout represent the births, marriages, and deaths recorded in the newspapers, but which have not been returned to the State office. These clippings are sent to the respective town clerks, accompanied by a circular letter asking them to learn whether the events described actually occurred, and, if they did, to make and return the records together with a statement of who was responsible for the failure to make the reports to him.

In the last three years, clippings from four or five newspapers, all weekly but one, have brought in as a yearly average about 140 records of births, 20 records of marriages, and 75 records of deaths which had not been received before, or a total of about 235 additional records each year.

Marriages.—In checking the returns of marriages, we have nothing to depend upon but the co-operation of the town clerks, to which reference has already been made, and the system of newspaper clippings just outlined.

Deaths.—Besides getting on the track of persons who have failed to comply with the requirements of the law, through newspaper clippings and the co-operation of town clerks we are now preparing to make use of the duplicate part of the transit permits returned to the office by the transportation companies, and also of the applications to the State Board of Health for disinterment permits.

This system of newspaper clippings entails much work, and the number of additional returns obtained is comparatively small. It is perhaps questionable whether the results pay for the trouble and expense. I have concluded that they do pay. The wide-spread moral effect of this system on those whom the law requires to perform certain duties is, I think, its greatest value, for they are made to perceive that information of lapses of duty is often received by the executive officer of the registration department. All these cases of default alphabetically arranged are recorded upon blanks and form what we call the "sombre list": it extends back over years. This list and the correspondence which it initiates show most of the cases of default to be unintentional, the result of occasional forgetfulness, accident, or misunderstandings. But it also reveals habits of gross and wilful negligence on the part of some physicians, undertakers, and persons, and constitutes a record which at any time may be made the basis of action on the part of the County Attorney.

THE PRACTICAL APPLICATION OF VITAL STATISTICS.

By William C. Woodward, M.D., Health Officer, District of Columbia.

The Committee of the American Health Association on Demography and Vital Statistics in their Sanitary Relations, in a report made in 1902, spoke as follows:—

"Deaths are registered primarily for legal purposes; that is, for the protection of certain rights and privileges of individuals and of families. This is the first and most important use of records of deaths, and the sort of utility which appeals most strongly to the general public wherever such records have been long kept. A subsidiary, though highly valuable, use of registration is for the compilation of sanitary statistics, by which the local, State, and Federal health services may direct their measures, improve their methods, and measure their results."

I am now somewhat inclined to resent the action of our committee—of which, however, I was an assenting member when this report was made—in asserting that the use of registration as a source of vital statistics is subsidiary to its use for legal purposes. Surely, if the health of the people should be the chief concern of the stateman, as has been wisely said, and if vital statistics serve to increase the efficiency of measures tending to preserve and to promote such health, the importance of registration is greater from a statistical standpoint than from the standpoint of the mere legal interests of an occasional individual or the occasional legal interests of the community as a whole. It may well be conceived that our committee had in mind, when it wrote its report, the actual extent and manner in which vital statistics are now used as indexes to the state of public health and as guides to sanitary effort rather than the extent to which they are susceptible of such use and the extent to which they should be so used. As yet, it seems to me, vital statistics serve but meagrely the ends of sanitation, and even by many professed sanitarians the possibilities for good which they contain are but poorly comprehended. Neither, I might add on the other hand, are the difficulties in the way of practical realization of such possibilities always comprehended.

The birth-rate is of interest chiefly from a sociological standpoint. Death-rates, general and special, and morbidity rates must be relied upon to show where and how sanitary work is needed, and to show the results of sanitary work already under way, and with death and

morbidity rates, therefore, we are chiefly concerned. Nowhere do the sanitary possibilities in vital statistics, and the difficulties in the way of their realization, become more apparent than in the study of the general death-rate, the popularly accepted index to the healthfulness of the community. For the death-rate of a community depends upon but four primary factors: first, an arbitrarily fixed unit of space; second, an arbitrarily fixed unit of time; third, the number of people; and, fourth, the number of deaths. And to the uninitiated it indicates well the sanitary condition. The secondary factors are, however, unfortunately almost innumerable. The number of deaths depends not merely upon the sanitary condition of the locality, or, speaking more broadly, upon its salubrity, but depends also upon the resistance of the individuals of whom the community is composed. When we go further and undertake to analyze the factors that go to make up salubrity, we find that they include the most varied conditions, as, for instance, the character and extent of changes of temperature, of prevailing winds, and of humidity; the character of soil; drainage, both artificial and natural; the character and location of dwellings; kinds of occupations; quality and availability of food supply and of water supply; the removal and disposal of wastes; and probably numerous other factors, all going to make up the entity that we call environment. And the variations in the character of the population which go to the determination of its resisting qualities are equally numerous,—age composition, racial factors, distribution by sex, intelligence, financial status, heredity, and so on. The slightest consideration must be sufficient, therefore, to show that, before the significance of a death-rate can be discovered, all of the factors and sub-factors that have been referred to, and probably others that have escaped mention, must be carefully investigated and evaluated. Only after this has been done for the same community from year to year, and after it has been done for various communities during corresponding periods, may it be possible to account, in part at least, for variations in the death-rate and to utilize the information thus obtained as a proper basis for action.

The greatest difficulty in determining the true value and the significance of the death-rate, along the lines laid down above, lies in the infrequency and incompleteness of census returns in so far as they relate to population. Returns of deaths may be sufficiently full and accurate to provide all data essential for work, but before different death-rates can be properly calculated, and their significance determined, it is necessary to have census returns for the same period compiled with equal fulness and accuracy and embodying corresponding data. It is not enough for the purposes of the health officer to know that in the territory under his jurisdiction more deaths occur during one period than during another,

but he must also know the causes of such deaths, and whether the fatalities were evenly distributed throughout the community or occurred in particular places or among particular classes of the population; and if the increase occurred with respect to certain diseases alone, or over limited areas, or in limited classes, he must be able to determine whether the increase was due to an increase in the population susceptible to that particular disease, or in the population living in that particular locality, or the population belonging to that particular class. If it was not due to an increase in the susceptible population, then by comparing those places and those classes in which it occurred with other places and classes showing similar mortality, and with places and classes in which it did not occur, he may ultimately learn something of the conditions leading to such increased mortality and discover means by which it may be prevented.

To carry this system to its logical conclusion, sanitary officers should have authority to require from time to time as investigations are under way, the reporting not merely of cases of death, as is now done, but also cases of disease, whether contagious or non-contagious. Investigations based upon reports of deaths alone cover relatively too small a number of cases to give the best results, and, moreover, fatal cases come to the knowledge of the sanitary authority in many instances too late to permit proper inquiry to be made as to the causes of the disease. It is probably only through some such systematic investigation of cases of non-contagious diseases, such as chronic nephritis, for instance, during the life of the patient, that the cause and method of prevention will be found.

Investigations such as have been suggested cannot be made through the mere compilation of vital statistics, but will depend largely on the analysis of the data which they contain. And for the purpose of furthering such analysis it will probably be found essential that trained investigators examine returns as they come in and supplement at once the information which they contain by information collected by personal investigation, if such added information is necessary to the proper classification and study of the case. Every record made should be carefully scrutinized at the time of its receipt to determine its sufficiency for purposes of the ultimate analysis to which it will be subjected, and any deficiencies should be supplied at once. To undertake to determine the condition of a community with respect to its health by mere office examination of written reports, without direct personal contact with the case reported and even without direct personal contact with those by whom such reports are made, is a more impracticable method of solving the grave sanitary problem that presents itself to the health officer than it would be for a chemist or a bacteriologist to undertake to determine the nature of chemical reactions or to determine the life histories of bacteria by simply

scrutinizing reports filed under similar circumstances. Work in the office must be supplemented by work in the laboratory and in the field, and in this case the community itself is the laboratory and the field in which the work must be done.

In order, then, that the greatest value may be obtained from the vital statistics that are being more and more extensively compiled every day, more attention must be paid to the scientific analysis of such statistics, not as mere figures but as scientific facts, so that they may actually afford a proper basis for rational sanitary measures rather than serve merely to flatter the community into a condition of self-complacency when the rates go down and to frighten it into a state of panic when they go upward.

SOME COMPARATIVE VITAL STATISTICS OF ONTARIO AND MICHIGAN.

By Mr. Archibald Blue, Chief Officer of the Census and Statistics Office of Canada, Ottawa.

In two of the oldest provinces of Canada, in Ontario and Quebec, plans for collecting and publishing vital statistics have been in operation for a quarter of a century. Birth, marriage, and death are the chief events in human life, and more than any others they determine the continuity of human society in a civilized state. Therefore, they should be authenticated: there ought to be the most substantial proof of the occurrence of each event as regards person, place, and time. And, as at the first and third a physician is usually present, and at the second and third a clergyman, it is eminently proper that the law should require those professional men, each in his own relation, to attest the facts of which he has personal knowledge. So the physician and the clergyman become in most cases the makers of original records in the field of vital statistics. The law makes this service a duty and an obligation at their hands, and, if in any instance they refuse or neglect to perform it, they are punishable as the law provides. Local municipal officers receive the records, and these officers in turn make reports to the Registrar-General, who gives them to the public in the form we call Vital Statistics once a year, or once in two years, or as often as the law or the government may demand.

In Ontario and Quebec this system works well, and, although provision has been made in some of the other provinces of the Dominion for a scheme of like character, it is not yet in general operation.

Besides these records, an enumeration is made for the whole Dominion once in ten years, in the first year of each decade, when the general census is taken. But this is for mortality only. It is a register by name of every death occurring in the census year, by sex, age, cause of death, conjugal condition, birthplace, origin or race, occupation, and date of death. Births in the census year may also be tabulated from the population and mortality schedules, although such a record is not an original purpose, and I think it would be an improvement if provision was made at future censuses for a full register of vital statistics.

I am not sure, however, if it is possible with the use of the best schedule and under the best system of enumeration, to get a full record of deaths at a census taken at the end of a year in a large country, whether sparsely

or thickly settled. In either case it is not always difficult to dispose of a dead body, if concealment is an object; but a more common cause of failure to procure a record is to be found in the circumstance that the dead are so soon forgotten by the living. Then there are cases when families have moved out of a locality within the year in which losses by death have occurred, and no one is concerned to give the information of death to the enumerator; and there are cases in which, for shame of the event, a death is denied. Even where the law provides that no burial shall take place without a permit and that records shall be supplied to local municipal officers by clergymen, physicians, and others more closely concerned, full returns of deaths are not always procurable. At the census of 1902 we collated our mortality records for Ontario name by name with those of the provincial government, and, after eliminating all duplicates from the two lists, we found about 5,000 names in the municipal records not in the census and about 4,000 in the census not in the municipal records. A similar attempt was made to collate the census and municipal lists for the province of Quebec, but, owing to the practice of the keepers of parish records there to enter married women by their maiden names, the comparison could not be made within the time then available for the task. In the State of Michigan, where corrections of a like sort were made, 10,000 names were added to the census and 2,000 names were found in the census which were not recorded in the State records. Of course, I cannot undertake to say that the latter were correct within a limit of 2,000, but I am disposed to think that the system in use in Ontario is as thorough and as well carried out as the one in Michigan, especially in view of the fact that, whereas the death-rate in Ontario in the census year was 15.24 per 1,000, it was only 13.9 per 1,000 in Michigan.

Another group of statistics may also be compared for a test, remembering that Michigan's census of population was 2,421,000 and that of Ontario 2,182,000. The statistics of some principal causes of death were:—

	Michigan.	*Ontario.*
Consumption	2,438	3,544
Diarrhœal Diseases	2,517	2,517
Diphtheria and Croup	539	750
Influenza	419	649
Pneumonia and Bronchitis	2,647	3,967
Typhoid Fever	680	833
Heart Disease and Dropsy	3,034	2,584

These differences are not easily reconciled when comparison is made of the soil, climate, and sanitary conditions of the two countries. But it should be stated that the classification of diseases was not the same, Canada having adopted for the 1901 census the Bertillon system.

A METHOD OF DEALING WITH UNREGISTERED DEATHS.

By Marshall Langton Price, M.D., Secretary, State Board of Health, Baltimore, Md.

1. *A method of dealing with unregistered deaths.*

Among the most annoying and perplexing of many annoying and perplexing problems with which registration officials have to deal are unregistered deaths. Like the *sine qua non* of the celebrated recipe for cooking rabbits, in order to deal with unregistered deaths, the unregistered deaths must first be found. The efficiency of registration in any registration area will largely depend upon the manner in which unregistered deaths are dealt with.

I shall mention only two methods of practical importance in discovering non-registration of deaths. The first is the census plan. At the time of taking the census full information is collected by the enumerators of the personal particulars, causes of death, etc., of decedents, and the enumerators' returns are then compared with the death records in order to identify the returns and to determine if any deaths are unregistered.

This method has many advantages, but two important objections may be mentioned. First, the information is not immediately available. It is always important to follow up these unregistered deaths at once, especially if violations of the burial permit laws are to be prosecuted. Misdemeanors in Maryland expire by limitation in one year from the time the offence is committed. Second, the evidence is generally hearsay, and applies to events of which it is often impossible to fix the date and which may have occurred more than one year previous to the time of taking the census. On this account deaths which have occurred in families in other States, and the bodies brought home for interment, are frequently credited to the State where burial occurred. Experience shows inaccuracies in the enumerators' returns in other particulars.

The second method is founded upon death notices appearing in the local papers. The latter method has been used recently by Dr. Wilbur to determine the efficiency of registration in the registration areas, and he has found so far that this information is in general more accurate and complete than that obtained by the enumerators. I have found this method such a valuable check on registration of deaths in Maryland that I expect to use it permanently in the future.

The State Board of Health of Maryland subscribes to the three principal papers of Baltimore and fifty-five town and county papers. These papers are sent to the Census Bureau, and clippings of death notices taken out and attached to the standard blank. As soon as these returns are received, they are carefully examined, and deaths outside of the State and in other jurisdictions eliminated. Those remaining are divided into three classes; viz., *possibly not registered, probably not registered,* and *not registered.*

A circular letter is then sent to the local registrar. Enclosed with this letter is an inquiry blank. These are filled out in duplicate and cut in two as soon as they are received by the local registrar. One part is retained by the local registrar, and the copy is sent to the proper sub-registrar in the town or county. Upon this blank are returned the name of the person, date, and place of death, and such other information as may be available. The other items of information are the cause of death, date of funeral, name and address of officiating clergyman, name and address of physician last in attendance, name of coroner, name of sub-registrar, name and address of officiating undertaker, place of burial. The last two questions asked are: Reason why permit was not issued, and reason why death certificate was not received?

Excuses like the following were generally for failure to answer these questions: "Sub-registrar away"; "sub-registrar sick"; "no sub-registrar." All of the cases, where necessary evidence was obtained, were prosecuted without regard to extenuating circumstances. Complete evidence can nearly always be obtained in this class of cases by diligent inquiry, and all of the cases brought to trial in this State resulted in conviction.

In many cases the data returned by the local registrar were not of the slightest value as evidence, and in many others were not returned at all. Those cases which fell in the *not registered* class were investigated by the Medical Officer of the Board (Dr. Rohrer).

The method of dealing with unregistered deaths may thus be summarized as follows:—

1. Original information from death notices in local papers.
2. Special information from investigation.
3. Prosecution.

I think I can safely say that on account of this system few illegal interments occur in Maryland without my knowledge, and that this number will be eventually cut down to a negligible figure.

MUNICIPAL REGISTRATION LEGISLATION.

By Charles V. Chapin, M.D., Superintendent of Health, Providence, R.I.

Dr. Wilbur has given me the opportunity of examining the ordinances and other local regulations relating to the registration of vital statistics which his department has recently collected. These ordinances were from fifty-six cities in twenty-five States.

While many of the American colonies made very early efforts to secure a registration of births, marriages, and deaths, it was done for legal purposes, such as the identification of the individual and to assist in the transfer and inheritance of property, there was no intent to secure data for purely statistical purposes. In this early registration the colonies took the lead, the laws were generally those of the colonial assemblies, and local regulations are only occasionally found.

It was different with the beginnings of registration intended for scientific rather than legal purposes. The collection of vital statistics received its first impetus in the towns, where the registration of deaths was desired for sanitary ends. Most sanitary reforms have been the result of startling outbreaks of disease, and the registration of vital statistics which, among many other uses, is of very great sanitary importance, has had a similar origin. The outbreaks of yellow fever, small-pox, and other diseases in the early part of the nineteenth century were doubtless the cause of the demand for the registration of deaths, and, as the cities were the chief sufferers in these outbreaks, it happened that they, rather than the States, were the first to adopt registration. I have not had an opportunity to give personal study to this historical aspect of the subject, but, according to Dr. Edward Jarvis,* New York, began to publish mortality statistics in 1804, Boston in 1813, Philadelphia in 1825, Charleston in 1834, Baltimore in 1836, and Providence in 1841, and Dr. Edward H. Barton,† writing in 1849, says that Norfolk, Savannah, Mobile, and Natchez had provided for the registration of deaths. In none of the States in which these cities are situated was State registration provided for until long after the cities had set the example, and several of the States have not as yet seen fit to do so.

* "Hygiene in America," Bowditch, 1877, p. 172.

† Report of the Sanitary Commission of Massachusetts, 1850, p. 413.

Louisiana was perhaps an exception, as a general registration law was passed in 1811,* but it was never properly executed, and Massachusetts was the first State that really secured a fair registration throughout the State, and that was many years after there had been registration in Boston. But conditions have changed, and at the beginning of the twentieth century we find the State leading in this work. While it is true enough that some cities in non-registration States do excellent work in recording births, marriages, and deaths, it is also true that many of the State laws recently enacted are exceedingly full and comprehensive, prepared with great care, and far better designed to secure good work than are most of the municipal regulations. Much of this advance is no doubt due to the influence of the Federal government in encouraging and assisting in the extension of the registration area, and the excellence of recent registration legislation is the result of the high standard set by the present director of the Vital Statistics Division of the Census Bureau. Hence it is not surprising that but few suggestions can be found in local regulations, and that their best provisions are taken from the recent State laws. We must look to the latter for guidance: the former are of historical interest chiefly.

New York has for a good many years had very good registration, for, although the State law is a comparatively simple one, it requires the return of births and marriages within thirty days, the filing of death returns, and the issuance of a permit before a body may be removed or buried, and this law has been intelligently enforced by the State Department of Health. In none of the cities in New York whose local regulations were examined were found any very valuable additions to the State law, the provisions of which were more or less closely followed by the local regulations. Several of the cities limit the time for making returns to ten or seven days, and in one city the limit for still-births is three days instead of the thirty of the statute. Several provide for the registration of physicians, midwives, and clergymen; one or two require that burial permits shall be returned by sextons and transportation companies; others require a local permit for the burial of bodies brought into the city. One city requires that returns shall be in ink, and in Yonkers the physician or midwife is to leave a blank with the parent for a return of the name of the child. But in the non-registration States of Pennsylvania and Ohio, with the exception of Philadelphia and Cleveland, most of the cities have continued to work under very meagre registration ordinances.

On the other hand there have very recently been some excellent local registration ordinances. Thus Kansas City, Kan., in the early

* Report of the Sanitary Commission of Massachusetts, 1850, p. 411.

part of the present year adopted a well-planned scheme for registering births and deaths.

But, if we can judge fairly from the local legislation examined (and I think we can), it would appear that, on the whole, local regulations are not as complete or as well thought out as most of the recent State laws, and only in rare instances equal the latter, or contain any new and important provisions. Nevertheless, many cities with very scanty legislation have managed to secure excellent registration. Thus, for example, in my own city burial permits were not required until 1864, yet for many years previous, under my predecessor, Dr. Snow, our records of deaths were equalled by few cities. We are forced to the conclusion that, while good registration laws are desirable, it is equally, if not more important, to secure efficient registration officers. If a registration law secures the appointment of good officials, the battle is more than half won.

An examination of the ordinances of the fifty-six cities shows that in all but eight the work of registration is confided to the health officials. This has always seemed to me by far the best plan for cities, and this appears to have been the general opinion. The interest which health officials have in vital statistics, the use which they make of them, and the scientific training which they *ought* to have, should make them something more than mere mechanical collectors and tabulators. In six cities the city clerk, and in one the city recorder, is the registrar.

It is noticeable that twenty-three of the fifty-six cities provide for the registration of marriages by the registrar of births and deaths, in each instance the health official. This seems to be characteristic of local rather than State registration, for in only nineteen of forty-two States are health officials made custodians of marriage records,—a much lower percentage. It seems to the writer very desirable that births, deaths, and marriages should all be recorded by the same officer.

In all but four, and these are unimportant cities, the necessary requirement for the accurate registration of deaths, a permit before burial, is in force. Only nine cities specifically require a permit for bodies brought from other places, though in several others the rules could be so interpreted. Only the very latest rules attempt to designate the duties of the family, the undertaker, and the physician in the preparation of the death certificate, as they are prescribed in modern State laws, but a number of cities do direct that the physician shall prepare or sign the certificate in a specified time. Usually, it is in twenty-four hours, but it is twelve in Raleigh, thirty in Knoxville, thirty-six in New York City and Youngstown, O., forty-seven in Augusta, Ga., and six days in Columbus, Ga. (Burial permits are not required in the latter city.) In three cities the undertaker must obtain the permit

twenty-four hours before burial, and in one city twelve hours before. Fifteen cities provide that sextons and transportation companies shall return all permits to the registrar, thus securing an important check on the returns. Most of the cities make no provision for a certificate for a death which occurs without the attendance of a physician, but about a dozen refer the case to the health officer, and in Mobile it is sent to the coroner, as of course it is in other cities when there is a suspicion of violence. Several cities make the next of kin or the householder equally responsible with the physician for the reporting of a death, or in one or two instances make them responsible only when there is no physician. Only a very few cities make any attempt to secure accuracy in the statement of causes, to specify the data to be reported, the form of the return, or the character of ink or paper, and there are very few specifications for the records. Among unusual provisions may be mentioned that of Mobile, that paupers shall be so designated on the returns, and that of Denver and Cleveland, that two certificates shall be furnished, one of which, properly indorsed, is to be used as a burial permit, In Nashville, if a body is illegally buried, the health officer may order its removal within twenty-four hours.

Nearly all of the ordinances examined provide for the registration of births as well as of deaths and doubtless in some of the others such registration is otherwise provided for. In all of the cities having such provisions the records are to be obtained by reports from physicians and others: in none of them is enumeration provided for either as a primary means of obtaining records or for a check. In every instance the physician or midwife in attendance at the birth is made responsible for the return, and in many instances the parents, next of kin, or relative present, has an equal responsibility, though occasionally the parent is only responsible when the physician fails to make the return. In one city the physician is to leave a birth return with the parent. Very many of the ordinances provide a time limit in which the return shall be made. In four cities it is within one day; in one city, two days; in one, three days; in one, five days; in two, six days; in five, seven days; in four, ten days; in six, thirty days. One city requires that the returns shall be made weekly, another on the first Monday succeeding the birth; two require reports to be made monthly; one on the first of the month, one in the first week of the month, one on the tenth of the month, and one in the first ten days of each quarter. Two cities require the physician to leave a blank with the parent on which the name of the child shall later be returned, if it is unnamed at the time the physician's report is sent in. In Kansas City, when the child is not named, the recording officer is to give the person reporting the birth a blank on which the name is to be reported later.

Many of the cities require physicians, midwives, and clergymen to

keep a registrar of all deaths, births, and marriages at which they officiate, and doubtless the same thing is done without legislation, as in Rhode Island, where birth blanks furnished with stubs and bound in a book are given the physicians and midwives. Many cities have the excellent provision that physicians, midwives, and clergymen shall register their names and addresses with the recording officer.

While local regulations are thus seen to be generally quite meagre, it is doubtless a fact that in many of the cities the registration is excellent because of the interest taken in it by the registrars. Many minor matters, which nevertheless are important, and which are provided for in the more comprehensive State laws, are in these cities equally well attended to by the local registrars, and office rules and customs, under such men, take the place of specific registration.

LIST OF CITIES WHOSE ORDINANCES WERE EXAMINED.

Alabama	Mobile
Arkansas	Fort Smith
Colorado	Denver
Delaware	Wilmington
Georgia	Augusta
	Brunswick
	Columbus
	Macon
Florida	Jacksonville
Illinois	Belleville
	Chicago
	Elgin
	Mattoon
Iowa	Dubuque
Kansas	Kansas City
Kentucky	Lexington
	Louisville
Louisiana	Baton Rouge
	New Orleans
Maryland	Baltimore
Massachusetts	Boston
	Fall River
Mississippi	Natchez
Missouri	St. Louis
Nebraska	Lincoln
	Omaha
New Hampshire	Dover
	Manchester
New Jersey	Hudson
	Montclair
	Morristown
	Paterson
New York	Albany
	Buffalo
	Dunkirk
	Newburg
	Rochester
	New York City
	Rome
	Utica
	Yonkers
North Carolina	New Berne
	Greensboro
	Raleigh
Ohio	Cincinnati
	Cleveland
	Youngstown
Pennsylvania	Johnstown
	Pittsburg
	Scranton
Rhode Island	Providence
Tennessee	Knoxville
	Nashville
Washington	Spokane
	Walla Walla
	Tacoma

THE PRACTICAL COLLECTION OF STATISTICAL DATA.

By M. O. Heckard, M.D., Registrar of Vital Statistics, Chicago.

The scope and power of Registrars in collecting data for mortuary statistics must vary to meet the requirements of their respective communities. The State Registrar views the subject from a purely statistical standpoint, and has not the legal power or means to inquire further. Indeed, he is fortunate if he obtains sufficient information for statistical purposes.

The City Registrar has the same statistical point of interest and two additional: one of the medico-legal and the other of sanitary importance, as prescribed by the laws of his particular locality. Therefore, every death certificate presented to the City Registrar contains three points of about equal interest, and raises in his mind three questions: First, does this certificate of cause of death contain sufficient information for a clear and definite classification? Second, is it sufficiently clear to prevent the concealment of crime or to locate the responsibility if death has been caused by violence? Third, is it sufficiently specific to enable him to make the necessary sanitary precautions to prevent the spread of contagion and properly conserve the interests of public health?

The interests of State and City Registrars are mutual so far as uniformity of collecting and compiling statistics is concerned. There is a wide difference, however, in their methods of obtaining reports of death and means of detecting failure to report. A city whose law requires a permit from the proper officer before a dead body is disposed of in any manner makes possible a complete registration of its deaths; but, before such results can be obtained, the complete operation of the law must be worked out in detail.

I will state briefly the method employed by us and the one that has given the most satisfactory results in our actual work:—

Our city ordinances make it unlawful to remove, bury, cremate, or otherwise dispose of any dead human body until a permit has been obtained from the Commissioner of Health or his duly authorized subordinate. Permission can be granted only upon presentation of a proper certificate of death. Resolutions of the State Board of Health, based upon State law, prescribe what information the death certificate shall contain. The statutes provide that deaths supposed to have resulted

from casualty, violence, or any undue means, shall be referred to the coroner, who alone is authorized by law to inquire into the cause and manner of such deaths. This law precludes the possibility of the return of any great number of unknown causes, the unknown being limited to the cases not recovered until decomposition had so far advanced as to prevent *post-mortem* examination.

After a death certificate is received by the Bureau of Vital Statistics, it passes through the hands of six people and is marked six different times before its final assortment. Being handled by so many clerks for the various purposes, the possibility of its being lost is materially increased. To make loss without immediate detection impossible while in the department, the certificates upon their receipt are numbered, beginning January 1 of each year with Number 1 and running consecutively throughout the year, and the numbers are copied from the burial permits. The closing number for 1906 was 29,048, which represents the actual number of deaths which occurred in Chicago during that year.

The undertaker carries blank forms of the certificate of death which is divided into two parts, the undertaker's report of death and the physician's certificate of cause of death. When called to the care of a dead body, he fills out his report of death, obtaining the information directly from the immediate family, and takes it to the physician who certifies to the cause of death and duration of disease. There are two exceptions to this rule; namely, deaths occurring in hospitals and those returned by the coroner. In hospital cases the entire certificate is filled out in the hospital from information obtained when the patient was admitted, and in the coroner's cases a report is made from the records of his office.

The undertaker in each case takes the certificate of death to the Department of Health, and exchanges it for a burial permit, and the number of the burial permit is written in the upper left-hand corner of the death certificate in ink; then in the right-hand blank space of the certificate the date of issue is marked with a dating stamp.

The name of deceased, age, place and date of death, are then written on a daily report blank, and the serial number is written just above the name. Then with a consecutive numbering machine the serial number is stamped in the upper right-hand margin of the death certificate. The day's certificates are kept together in numerical order, and at the close of each day are checked over by the permit clerk to see that no number is missing, bound together, and passed to the recorder who verifies the count and makes a memorandum of the beginning and closing number of each day and the total number contained. They are again bound together and passed to the marking clerk who, after checking back with the recorder, marks the classification (disease) number with blue pencil in the upper right-hand space, makes his daily tabulation of cause of

death, bundles them again, and with his memorandum passes them to another clerk who marks the sanitary divisions of the city with red pencil in the right-hand margin and copies special diseases on cards. From this desk they go to another where a tabulating card is punched and the permit number and initials of the deceased are placed upon the card. Each clerk who handles the certificates checks them with the preceding.

With this system of checking it is impossible for a death certificate, after it once reaches the permit desk, to be lost without immediate detection. If a number is missing, it is only necessary to refer to the daily report to get the name, age, place and date of death, and thus, if necessary, a new certificate.

The burial permit is made with a counterfoil, which bears the same number as the permit. These numbers run consecutively, beginning on January 1 of each year with Number 1, and are printed on the permits. This is the number that is copied on the death certificate. The undertaker, on receiving the permit, fills out the coupon, copying the information from the burial permit. This permit, with coupon attached, is presented by the undertaker to the superintendent of the cemetery at the time of burial. The superintendent signs, dates, and returns the coupon to the department in a stamped return envelope furnished by the department.

The coupons, when returned to the department, are arranged in numerical order, checked with the death certificates and stamped "Interment Verified." They are then placed in filing cases, as permanent receipts for burials.

An annual inspection of cemeteries is made, and the department records of permits are checked with the cemetery records of interments. Thus burials of the dead without proper permit are reduced to the minimum. In the last year there has been but one body removed from the city without the legal authority, and in this case successful prosecution followed.

Every death that occurs in Chicago, whether of a resident or of a non-resident, is counted, including death of every child that has breathed. All visitors who are taken sick and die here, all deaths of non-residents from accident or violence, occurring within the city limits, and all patients who have come to Chicago hospitals for treatment and die here are included in Chicago's death-rate.

On the other hand, residents of Chicago who die elsewhere are not included in our mortality. There is one exception to this rule. Patients who die at the County Institutions at Dunning which is just outside of the city limits, and who were residents of Chicago, are charged back to the sanitary divisions from which they came.

This method of securing returns has proven very satisfactory, so far as

obtaining reports of death is concerned. A definite and comprehensive cause of death is a very different matter, and leaves a great deal to be desired. Many certificates give a long train of symptoms and conditions as cause of death, and in the end omit the disease which was the real cause. Other certificates show two or three diseases without giving their duration, and all of this notwithstanding the fact that suggestions are printed and arranged on the certificate wherever possible. Even with the closest scrutiny of the certificate and the constant use of the telephone, communicating directly with the physician in all doubtful cases, it is difficult at times to make a classification.

The estimated population of our city used in compiling our mortuary statistics is that furnished by the United States Census Bureau.

The registration of births in Chicago has not compared favorably with that of the deaths for obvious reasons. The statutory laws were about the same in their scope and provisions, each being mandatory in character and providing a penalty for failure to report. Each met with the same indifferent treatment from the profession until the enactment of local laws made a comprehensive system of checking on death reports possible. The duty of enforcing this law has been placed upon one who was directly interested in its success. The birth laws have been changed several times and different means employed in an endeavor to secure more complete returns.

The department at one time supplied physicians and midwives with printed postal cards for the return of births, and all the physicians had to do was to write the name of the mother, date and place of birth, and drop it in a mail box. This was certainly as little trouble as a physician could be put to and do anything at all. Under this system Chicago registered its greatest number of births, 29,568, in the year 1900; but what is 29,568 births per annum for a city of about 300,000 women of child-bearing age? Upon receipt of physician's report card the department mailed a blank, containing space for complete data, to the parents, and the birth records were made from the information obtained in this way.

In May, 1903, the State birth law was amended and certificate prescribed, which rendered the card system inoperative. This law provided for the payment of 25 cents for every report of birth, and declared it a county charge, to be paid out of any county funds not otherwise appropriated. This law went into effect July 1, 1903, yet not a fee has been paid for report in our county. The law further divides the responsibility among physicians, parent, and householder, which is sufficient in itself to render it ineffective, and the responsibility of prosecuting for failure to comply with its terms was placed upon the State's attorneys of the respective counties. With this array of disinterested people in charge

it is not at all surprising that our births returns dwindled to 25,171 in 1906, 4,397 below the high point of 1900.

With the yearly increase in population of 58,435 and an annual addition to the school enrolment of 29,701 children, there is certainly room for considerable improvement.

The department, after a thorough consideration of the question, has formulated a plan of action looking toward the correction of the two causes of failure in the past. First, we propose to ask for an amendment to the law, to place the responsibility on an individual, and, secondly, local legislation to provide a means of checking failures to report. The best means of checking reports of births, and one that will at once place it on a par with report of deaths, is a law requiring each child to present a certificate of birth upon entrance at school or upon beginning employment of any kind, and providing a penalty for any teacher or employer who admits any one under twenty-one years of age to school or work until this formality has been complied with.

If we are successful in our endeavor to secure local authority for this, we hope to be able to report favorable progress at our next meeting.

AN AID IN THE SECURING OF RETURNS OF VITAL STATISTICS FROM PHYSICIANS.

By Ernest C. Levy, M.D., Chief Health Officer of Richmond, Va.

That the reliability of vital statistics in any community rests fundamentally upon the promptness, completeness, and accuracy of the reports submitted to the authorities by the physicians is axiomatic. Yet every health officer is painfully aware of the difficulties encountered in getting the doctors to do their part in a thoroughly satisfactory manner.

Upon assuming charge of the Health Department of the City of Richmond in July, 1906, I at once found that we were getting very incomplete returns. So far as certificates of death were concerned, there was no trouble, our ordinances prohibiting the interment or removal from the city of any dead body without a written permit from the Health Department, which permit is issued only on the presentation of a properly executed certificate of death. Returns of deaths were, therefore, complete, at least so far as their actual number was concerned.

In the matter of reporting births and contagious diseases, however, the utmost looseness prevailed, as shown by the fact that the average annual number of births reported during the preceding six years (since which time the ordinance had been in force) was only 685, which was at an annual rate of 7.97 per 1,000. The incompleteness of the returns of contagious diseases was fully evidenced by the enormous ratio which the deaths bore to the reported cases.

In casting about for the best means of correcting this state of affairs, the secret of success appeared to lie in convincing the doctors of the importance of the matter and then in making the reporting of all cases as easy as possible. This was deemed a far better course than endeavoring to correct the trouble by legal procedure. The cordial support of the entire medical profession of a community means everything to a health officer, and no great cordiality can prevail after a doctor has been subjected to the ignominy of appearing in police court before the usual gaping crowd, of being mulcted for even a few dollars of his hard-earned money, and of having his disgrace reported in the newspapers.

The two chief difficulties in the way of getting prompt and complete reports seemed to be ignorance on the part of physicians as to what contagious diseases they were required to report and the fact that they

could not always lay their hands readily on the special form required for making the report.

In order to get around these difficulties, a special outfit was gotten up and distributed to every doctor in Richmond at the end of December of last year. It consists of a pasteboard box, 8 by 10 by 3½ inches, covered with marble paper, and with a let-down front, admitting of easy access to its contents. On the front of this box the words "Board of Health" are printed in gold letters. The whole makes a rather ornamental, certainly not an objectionable, addition to the office equipment of the doctor.*

On the inside of the lid of this box is printed a "Condensed Schedule of the Duties Demanded of Physicians by City Ordinances," under which are stated, very briefly, the laws relating to the reporting of deaths and births, with the penalties for violation, and the law relating to the reporting of contagious diseases and recoveries therefrom, with the penalty for violation. A full list of the reportable diseases is given, printed in prominent black-face type. Finally, there is a direct appeal for co-operation, but this ends with the statement that "when convinced that any physician is systematically violating any ordinances above outlined, it will be necessary to bring such violation to the attention of the proper authorities, and see that the prescribed penalties are enforced."

This box contains a full supply of all forms needed in complying with the ordinances,—birth and death certificates and postal cards for reporting contagious diseases, tuberculosis, and recoveries from contagious diseases. A liberal supply of stamped return envelopes is also enclosed, for use especially in mailing birth certificates, but also for any other official business, the theory being that the doctor should not be put to a cent's expense for doing that which is for the benefit not of himself, but of the Health Department and the community. A final form consists of a special blank (postal card) to be used by the doctor in asking for a new supply of any other form. When this request is received at the office, there is always sent, along with the special forms for which he asked, another of these request forms. In this manner there is never any excuse for a doctor's running out of forms of any kind.

This device has worked admirably, and we are now getting very satisfactory returns. The improvement has not been due to this single factor, of course, since the other methods employed have contributed to that end. Numerous circular letters have been sent to the doctors, and a careful checking system of death certificates has been followed, where the cause of death was any one of the reportable diseases, and also where the decedent was under one year of age. Besides this the

*The boxes were made in Richmond and cost $12.50 per hundred.

sanitary officers are instructed to get full information, when visiting a house for any purpose, as to all infants under one year of age living there. This information is followed up, and many previously unreported births have thus been gotten at, as well as the names of a number of midwives who had not registered with the Health Department as required by law. All these things have contributed to the securing of more complete returns, but it is believed that the outfit described has played an important part. Several other cities, New York among the number, have since adopted the idea.

PRACTICAL WORKINGS OF MICHIGAN'S BIRTH REGISTRATION LAW.

By William F. Petrie, Chief of Division, Vital Statistics, Michigan.

The accurate registration of births, as you all well know, is a subject requiring much consideration, and one upon which much time and thought has been spent in Michigan by registration officials and others. Births were enumerated in the State of Michigan by the supervisors and assessors, beginning with the year 1867, but the results were anything but satisfactory. Probably less than two-thirds of the births that actually occurred in the State were recorded under this system, and the particulars given in regard to the births reported were in many cases incomplete, and some of the statements were incorrect. This manner of reporting births is undoubtedly in vogue in many of your States, and how true the results are is well known to you.

After repeated efforts the Department succeeded in having a law for the immediate registration of births placed on the statute books at the session of the legislature for the year 1905. This law took effect on January 1, 1906, and from the very start has been a success. Like all new laws, however, it takes time to educate the people, and, although much publicity was given to the law, through the press and otherwise, some one is occasionally discovered who has not heard of the law, and seems surprised that they should be compelled to register a birth in their own family.

Considerable trouble was experienced for a few months after the adoption of the law on account of the antagonistic spirit displayed by some of the physicians, who declared that, owing to the fact that a fee was not provided for filing a certificate, the law was unconstitutional, and that they could not be compelled to do something for nothing and consequently would not file a certificate. Fortunately, they were convinced of their error without recourse to prosecution, yet I could see from the manner in which many of the doctors made their reports, that the antagonistic spirit was still there.

While I believe it is considered desirable by some authorities to offer inducements for the return of births by the payment of a small fee for each birth reported, and while it may prove an incentive in some cases, the main reliance for complete returns must rest upon enforcement

of the compulsory requirements of the law. The recent session of the legislature, however, made an amendment to the law, providing for a fee of fifty cents to be paid to the physicians, midwives, or nurses filing certificates of births. This amendment took effect on June 27, 1907, and there is no reason why every birth occurring in Michigan should not be reported, as the chief objection has been removed. The effect of this amendment is very noticeable, as many physicians who were very negligent in filing certificates are now filing their certificates within the ten-day limit.

The filing of the supplementary report of the given name of children was also a problem confronting the Department. The law provides that the report should be made by the physician or person filing the certificate, and in a great many instances the parents were not ready to name their child at the time of birth; and to compel the physician to make extra trips to obtain the name would undoubtedly in many cases work extreme hardship, especially in sparsely settled districts, where long drives would have to be made. Such extra trips were made in several instances by some of our physicians only to learn that the parents were not yet ready to name the child. In view of this fact the Department advised the physicians and others interested to file the certificates and, in all instances where the parent was not ready to name the child at the time of birth, to leave a supplemental blank with them, requesting that it be filed with the registrar as soon as the child was named. This plan has worked very well so far, but in a great many instances registrars have failed to report the names to the Department after being filed by the parent.

To secure the given names on certificates lacking this information for births filed during the year 1906, the Department in November, 1906, sent correction blanks to registrars for all certificates filed in the first six months of the year that lacked this item, and in June of the present year correction blanks were sent for the last six months of 1906. Many names were thus secured, so that the percentage of unnamed children born during the year 1906 and on file in the Department of State is very small. The amendment to the birth registration law, referred to above, requires a sworn itemized statement to be submitted by the physicians and others making claims for fees for certificates filed, and, as this statement is to be filed in the Department, it will undoubtedly contain the Christian names of many children not named on the original certificates, and thus enable the Department to complete the certificate.

There is still another method used by the Department to determine the accuracy of the birth returns; namely, a comparison of the returns of deaths with the returns of births, the ages determining whether a

birth certificate should have been filed since the birth registration law went into effect. This, of course, requires considerable labor, but the results obtained will, I believe, fully compensate for the time spent in checking them up, and many births will be registered that would have escaped registration, had it not been done. This is especially true of still-births, many physicians holding that it is not necessary or important that such births be reported. While not of any real statistical value, it is very important that they be reported, for in many instances physicians, in signing a death certificate, enters in the space provided for the cause of death the word "still-born," and in the space above the words "last saw him or her alive on blank date and that death occurred on date stated above." If they saw the child alive, then the notation "still-born" is incorrect, and it is the practice of the Department to treat all such returns of children as under one year of age for compilation purposes. In every instance where still-births are returned from any district as deaths, examination is immediately made to see if a birth certificate has been filed, and, if none has been returned, the physician is requested to file one immediately.

There is still another check on the returns made to the Department by the different registrars. The law requires that a list of the births filed with the different clerks of the State shall be furnished all supervisors and assessors. These last-mentioned officers are required, when making their annual assessment during the month of April, to make diligent inquiries whether any births have occurred in the families visited by them during the preceding calendar year, and, if they find any and the birth does not appear on the list furnished by the clerk, a certificate of the birth is immediately made out by them and filed with the clerk of the district in which the birth occurred. As a fee of twenty-five cents is provided for every birth certificate filed by these officers, it is reasonable to suppose that the work is done thoroughly and that not many births escape registration. There would be no possibility of any births remaining unreported if the assessors made a house-to-house cavass, as the law requires, but many of them fail to do so, and in consequence some births are liable to escape registration. For the year 1906 there were 224 births returned by the supervisors and assessors, but I do not anticipate that there will be nearly so large a number for the year 1907, owing to the fact that people are becoming better acquainted with the law and that the fee of fifty cents is now provided for the filing of the certificate.

The question may be asked, "Are all births occurring in Michigan registered?" Answering it honestly, I am compelled to say that I do not know. The different registrars of the State are requested to report to the Department any physician, midwife, or parent that fails to file

proper certificates with them, and every month brings many such reports. The Department then takes the matter up, and in most instances the reports are filed promptly, but I presume that a number of births occur throughout the State for which certificates are not filed and no report made to the Department.

For the five years immediately preceding the year 1906 the average number of births returned yearly by the supervisors and assessors under the old law was about 43,000, while for the first year under the new law there were about 60,000 birth certificates returned, which is nearer the correct average of births each year.

The figures published by the Bureau of the Census affirm this view. They give the annual average rate of increase between the years 1900 and 1904 as 27,259. This corresponds so closely to the rate of increase (namely, 28,000), obtained by subtracting the average deaths (about 32,000) from the average number of births (about 60,000) that I am safe in believing over 95 per cent. of the births that occur in Michigan in the course of a year are registered.

TRANSIT PERMITS.

By Franklin C. Gram, M.D., Registrar of Vital Statistics, Buffalo, N.Y.

When transportation companies find that they have a dead body on their hands, after having presumably shipped it to its destination, they begin to inquire into the matter, and usually they find that either through the carelessness of the agent or negligence of the authorities at the starting-point the proper transit permit was not secured. A dead body is unlike ordinary merchandise, which may be held until the neglected bills of lading are secured, and the health authorities at the destination refuse to allow it to remain within their jurisdiction and demand its return whence it came,—naturally at the expense of the transportation company, which ought to have demanded the necessary credentials before accepting it for shipment in the first instance.

No company ever requires a second demonstration of this kind. *One* is usually sufficient to emphasize the point with every official who has charge of such matters. This is the principal reason why transit permits have become a universal necessity. Could transportation companies afford to take the chances, such permits would doubtless be neglected. However, this is not the principal reason from the point of view of the sanitarian and the health authorities.

From an intimate study of many thousands of transit permits received at the Bureau of Vital Statistics in Buffalo, I long ago formed the opinion that the views of the respective authorities who issued them differ about as widely as it is possible for the mind of man to be at variance on any one subject, and still try to accomplish a necessary end. A brief analysis of some of the principal permits on file will make this clear.

Here is a mass of documents accompanying a body from one of the European countries. They include a certificate of death from the attending physician, a certificate from the undertaker and embalmer, an affidavit from a relative, a transit permit from the local authority, a certified translation and other certificates from the American consul, shipping permits, and a certificate on the outside coffin box to the effect that the enclosed body is that of the person which it purports to be. The body is found to be carefully and thoroughly embalmed, then

packed snugly in sawdust in a heavy zinc coffin, which is hermetically sealed and enclosed in a strong outer box with sufficient handles. I have seen such a combination so heavily constructed as to require as many men in handling as could possibly get a hold, while a dray was necessary to convey it from the depot.

Next we have a document issued by a local authority in a certain State, to the effect that the accompanying body died from typhoid fever, which is given as a "non-communicable disease," but the body was, nevertheless, placed in a "hermetically sealed case," and said "hermetically sealed case" was found to be leaking fluids to such an extent that the railroad officials declared they would have refused to carry the body any farther, had it not been so near its destination.

Then comes a permit containing a certificate from the attending physician, with the usual data found on our standard certificate, a certificate from the embalmer, and a proper permit from the local health authority.

Next we have one from a division registrar who certifies that the proper death notice has been filed with him as required by law and permission is granted to "bury or remove" said body; but the permit contains absolutely no information aside from *the name of the deceased.* Indeed, the Grand Trunk Railroad has encountered so many difficulties with the various kinds of permits that it requires a form of its own to be used for all dead bodies shipped over any of its lines. This form embodies the local requirements of all the States and provinces through which the railroad extends.

Transit permits may be defined as *documents issued by the local health authorities at the place from whence a human dead body is to be shipped to some point beyond the jurisdiction of the initial authority.* Their object should be threefold, (1) sanitary, (2) transportation, and (3) statistical. (1) Sanitary, as an evidence that the usual methods prescribed by modern science have been employed in the preparation of the body for shipment; that it is enclosed in an outer and inner case sufficiently safe both as regards the cause of death and the length of time it is expected to be in transit; and that the responsibility for all such preparation is assumed and vouched for by the local health authorities issuing such permit. (2) Transportation, by acquainting the common carrier with the exact condition of the body, its inner and outer preparation, and giving the necessary authority for conveying the same. (3) Statistical, in giving all interested parties, as well as the health authorities at the destination, complete data relative to the deceased, so that an intelligent record may be kept for future use.

The necessity for a standard permit and what it should contain is a subject which, it seems to me, the American Public Health Association

has persistently overlooked, at least it has failed in accomplishing adequate results. It is a pertinent matter for the Section of Vital Statistics to deal with, because its members are more intimately acquainted with the various points involved, and have learned by experience what is essential. Why are standard permits necessary? As said before, there is no uniform system at present. Hardly any two States have similar forms, and we are aware that even in the same State a multiplicity of forms exist. We are also aware that some localities have receded from the advanced stand they had taken because of the pressure brought by the undertakers' association, who claimed that certain requirements were against their interests. We know that some State authorities take the advice of undertakers in preference to that of the physician or sanitarian, when about to make any contemplated change in any subject in which both are interested.

Standard forms for transit permits are as essential as standard death certificates. There should be a uniformity in such matters throughout the jurisdiction of this association. They should be divided into four parts, or certificates, forming one blank. The first part should contain a doctor's or coroner's certificate, signed by the same person issuing the death certificate for filing at the local health office, and containing data similar to our present standard death certificates. Concerning this there is a difference of opinion. It is used by some States, and has been required and again discarded by others. The greatest objection which I have found came from the undertakers, who claimed that it imposed extra work by requiring them to have the attending physician fill out this blank. This is hardly a tenable reason, since the physician's certificate of death must be obtained and filed before a transit permit can be obtained, and the extra labor involved in securing this duplicate for the transit blank is not worth mentioning. The benefits, moreover, more than compensate. We are constantly learning by experience that this very evidence may be as important at the point of destination as it is at the initial point, besides giving a complete record at the former, the place where the body is to rest permanently.

The second part should contain a certificate from a licensed embalmer, certifying how the body had been prepared for shipment. This is perhaps the most important feature, and should be rigorously enforced. Inasmuch as some might get the impression that this certification is a mere matter of form, a sufficient penalty should be imposed and the license revoked if an embalmer is convicted of falsifying such a document. All depends upon the honesty of the undertaker in these cases. Certain methods of preparing bodies for shipment should be prescribed and embodied into rules, to be printed on the back of all transit permit blanks, for the information and guidance of interested parties. It is

obviously impossible for health commissioners or registrars of large cities personally to inspect all shipping cases before issuing a transit permit, and for that reason the undertaker who is found to have misused the confidence placed in him should be severely dealt with.

After the doctor and the undertaker have certified to their respective portions, then the health authorities should officially vouch for such correctness and sanction the removal of the body. This should form the third part. The last division of the blank should be left for the transportation companies.

Should transit permits be issued in duplicate? I would unhesitatingly answer this question in the affirmative. Experience has demonstrated that much delay and annoyance is caused by the loss of a transit permit. One copy should be pasted on the outer box, and the other given to the person in charge of the body.

The transfer of disinterred bodies is an important matter which needs attention. Some States have made proper provision, others have rules which they do not enforce. It is no common occurrence for a disinterred body to arrive at a place, in violation of local or State laws, while the health authorities are told that "the body is here, what are you going to do about it?" To compel its return would involve legal difficulties. To prevent its burial would turn the sympathies of the community against those who are striving for a principle. Then, again, the shipment may have been made in conformity with the rules of the locality where the body was disinterred, these rules being at variance with those at the point of reinterment. At all events, the same law would not govern in both instances, and therefore would be difficult of enforcement. For these and other reasons, before a body is permitted to be disinterred, the consent of the State Board of Health and of the Board of Health at the point of destination should be obtained, after which disinterment and shipment may be allowed under sanitary restrictions.

Whenever shipment is made in death from a communicable disease, telegraphic notice should be sent to the health officer at the destination thereby enabling him to take any measures necessary for local protection. It may be used also as a check on the manner in which the body was prepared and shipped.

In examining many transit permits, I find the same diseases placed in the communicable as well as the non-communicable class, evidently showing a difference of opinion as to where they belong or ignorance on the part of the person who made the designation. It is therefore essential to have an understanding as to this classification, with a view to securing uniformity. When this list is determined, it should be printed on the back of the standard transit blanks.

What is an hermetically sealed case? Manufacturers of caskets

would answer this question to suit their individual efforts. Iron, zinc, grooved, rubber-lined, locked, and many other styles of cases have been "guaranteed" as hermetically sealed, but found to be wofully wanting when put to proper test. It should be uniformly understood, and so designated in the rules, that no coffin is considered as "hermetically sealed" unless it is made of copper, zinc, or heavy tin, and all seams carefully soldered.

Most forms of transit permits now in use are encumbered with several coupons, for the existence of which I have never been able to find the ghost of an excuse. Registrars are familiar with these vermiform appendixes, and it would therefore be a waste of energy to describe them. The very fact that not a single coupon meets with its intended use, but remains a part of the original blank, is sufficient evidence of its superfluous nature.

THE DEATH-RATE OF THE CITY OF NEW YORK AS AFFECTED BY THE COSMOPOLITAN CHARACTER OF ITS POPULATION.

By William H. Guilfoy, M.D., Registrar of Records, New York City.

This study was suggested by the "marking-time" during the past few years in the progress of the death-rate of the city toward an expected lower level. In seeking the causes of this halt in a hitherto uninterrupted decrease, the writer became impressed with the significance of the part played by the influx of the immense number of immigrants from continental Europe. In a community of four and one-quarter millions of people (a fair estimate of the population of the city) it is reasonable to suppose that the presence of one and three-quarters millions of aliens would appreciably affect the death-rate of the community, especially when we consider that the customs, habits, and environment of fully 80 per cent. differ widely from the requisites for the making of a healthy member of the body politic. During the fiscal year ending June 30, 1907, the number of aliens arriving at the port of New York was 1,004,000, and of that immense number only 50,000 were credited to Great Britain and Ireland. Well might the student of political, social, and hygienic economy ponder over the question of the assimilative capacity of the country at large and of the urban communities in particular!

The crude death-rate, as ordinarily used in comparisons of cities and countries, is, as you all know, a much-abused weapon of offence and defence, but in the comparison of a city's hygienic progress or retrogression with its own past it may be depended upon, provided no great change has taken place in the population as regards age, sex, or occupational conditions. An application of standard death-rates at a series of age-groups was made to the population of the city as ascertained by the censuses of 1875 and 1900, and it was found that the resulting difference did not exceed one-tenth of one point per thousand. Therefore, it seems allowable to use the crude death-rate of this city as an index of the prevailing sanitary conditions, and an analysis of the factors affecting its increase or decrease may be indulged in.

In analyzing the following tables, we must not at any time forget that all conclusions are, of necessity, more or less tentative by reason of

TABLE I.

DEATHS AND DEATH-RATES PER 100,000 ACCORDING TO NATIVITY OF DECEASED IN OLD CITY OF NEW YORK, 1906.

CAUSE OF DEATH.		POPULATION AND NATIVITY.													
		Total.	United States.	Ireland.	Germany.	Italy.	Russia-Poland.	England.	Austria-Hungary.	Scotland.	British America.	Switzerland.	France.	Bohemia.	Sweden.
		2,464,432	1,551,854	198,028	231,050	104,954	134,714	49,283	73,920	14,602	15,550	6,382	10,952	10,951	20,077
All Causes	Deaths	46,108	28,067	5,795	3,966	1,906	1,824	852	1,227	276	239	157	256	204	225
	Death-rate	*1871*	*1849*	*2926*	*1717*	*1816*	*1354*	*1729*	*1660*	*1890*	*1537*	*2460*	*2337*	*1863*	*1121*
Typhoid Fever	Deaths	369	208	41	22	32	8	8	21	2	2	1	5	2	4
	Death-rate	*14.9*	*13.7*	*20.7*	*9.5*	*30.4*	*6.7*	*16.2*	*28.4*	*13.7*	*12.9*	*15.7*	*45.7*	*18.3*	*19.9*
Pulmonary Tuberculosis .	Deaths	5,900	3,156	944	434	290	224	112	246	52	30	36	34	48	47
	Death-rate	*239.4*	*207.9*	*476.7*	*187.8*	*276.3*	*172.4*	*227.3*	*332.8*	*356.2*	*192.9*	*564.2*	*310.4*	*438.2*	*234.1*
Cancers	Deaths	1,856	563	330	351	69	172	69	112	22	24	12	18	27	17
	Death-rate	*75.3*	*37.1*	*166.6*	*151.9*	*65.7*	*132.9*	*140.0*	*151.5*	*150.7*	*154.3*	*188.0*	*164.3*	*246.0*	*84.7*
Heart Disease	Deaths	3,506	1,320	755	535	169	222	102	141	31	27	19	37	26	14
	Death-rate	*142.3*	*86.9*	*381.2*	*231.5*	*161.0*	*170.0*	*207.0*	*190.7*	*212.3*	*173.6*	*297.7*	*337.8*	*237.4*	*69.7*
Broncho-pneumonia . .	Deaths	3,379	2,875	145	99	113	43	18	24	11	5	7	8	3	2
	Death-rate	*137.1*	*189.4*	*73.2*	*43.2*	*107.7*	*34.2*	*36.5*	*32.5*	*75.3*	*32.2*	*109.7*	*73.0*	*27.4*	*10.0*
Lobar Pneumonia . . .	Deaths	3,303	1,750	572	294	232	108	70	80	29	23	9	23	10	18
	Death-rate	*134.0*	*115.3*	*288.8*	*127.2*	*221.1*	*83.9*	*142.0*	*108.2*	*198.6*	*147.9*	*141.0*	*210.0*	*91.3*	*89.7*
Chronic Bright's	Deaths	3,232	1,205	812	491	113	155	99	97	33	36	13	26	28	20
	Death-rate	*131.2*	*79.4*	*410.0*	*212.5*	*107.7*	*121.0*	*209.0*	*131.2*	*226.0*	*231.5*	*203.7*	*237.4*	*255.7*	*99.6*

the entire absence of age-grouping among the different nationalities and races comprising the population of the city. The presence of such a grouping is almost a *sine qua non* in the discussion, and the means taken to provide a substitute therefor, poor though it may be, consists in the preparation of tables of deaths and death-rates from certain causes and in certain districts, the causes being those that affect chiefly certain age-groups, and the districts such as are typical of certain nationalities, races, and age-constitution, thus enabling tolerably fair conclusions to be arrived at.

In Table I are shown the deaths and death-rates per 100,000 from all causes and from certain prominent causes by nativity of descendants in the old city of New York (present Boroughs of Manhattan and the Bronx) for the year 1906. At first glance at the general death-rate column it would seem, if we compare the death-rate of *1849* per 100,000 of persons born in the United States with that of *1871* per 100,000 for the entire city, including all nativities, that there is very little effect produced on the rate by the mortality among the foreign element, but it must be borne in mind that, of 28,067 deaths attributed to the United States, only 10,080 had American parents, the rate among the latter being about *1440* per 100,000, the remaining 18,067 deaths of natives born of foreign parents producing a rate of *2256* per 100,000. This low mortality of *1440* per 100,000 among the native Americans and immediate descendants of native fathers and mothers and the high rate of *2256* among descendants of foreigners might be accepted and conclusions drawn therefrom, provided assurance could be given that the age-periods of these two groupings of the population were approximately the same; but this is not the case. The greater fecundity of the alien produces an undue proportion of children in that group under five years of age, and naturally a higher general death-rate is the result. The difference between the two rates is so great, however, that unequal age-constitution does not account for all of the increase. Density of population, sanitary surroundings, personal habits and cleanliness, poverty, etc., play a most important part in increasing the mortality among the descendants of aliens.

The general death-rate of the natives of each country specified in Table I is instructive, though in the comparison of one with the other it is open to the same objection; namely, the lack of specific figures as to age-constitution. The Irish lead with a rate of *2926*, while the Swedes apparently are the healthiest, with the low rate of *1121*. The high rate among the former is *partly* explainable by the fact that between 1847 and 1893, a period of forty-six years, the influx from Ireland was immense and constant, while for the past fourteen years the numbers have been small in comparison, thus producing an Irish population in this

city whose age distribution, especially at ages fifty and upwards (assuming the average age of each immigrant to be twenty-five years), is favorable to an exceedingly high death-rate, and the low death-rate among the Swedes being partly explainable by the fact that immigration from Sweden began at a comparatively recent year (1885), and that there is, as a result, a preponderance of adults at ages between twenty-five and fifty, at which ages the normal death-rate ranges between 10 and 12 per 1,000. What has been said of the Swedes is true of some of the other nationalities; for example, the Italians, Russians, Poles, and Hungarians.

In considering the mortality from typhoid fever in this table, remembering that this is a disease that attacks all ages, we find that, omitting those nationalities where the deaths do not number twenty or over, the Italians and Austro-Hungarians present the highest rates. This is what we might naturally expect by reason of the well-known unsanitary personal condition of these classes. The Germans and the Russian Poles, on the other hand, afford the lowest rates, the reason in the case of the Germans being the habitual cleanliness of this nation, and of the Russian Poles the prevention of direct infection by the removal of most cases among them to hospitals for treatment.

Interesting indeed are the figures presented in the table of the mortality from pulmonary tuberculosis. Switzerland leads the list with a rate of *564*, Ireland comes next with *476*, Bohemia follows with *438*, then Scotland, Austria-Hungary, and Italy follow in the order named, Russia-Poland bringing up the rear with the comparatively low rate of *172*. Disregarding the Swiss, who number only a little over 6,000 and taking up the rate among the Irish, we are confronted with the remarkable rate of nearly *500*. This is partially explained, as already noted in commenting upon the higher general death-rate among the native Irish, by the unfavorable age-grouping of the Irish population. The average age at death of the Irish from this disease, based upon two hundred deaths reported, was found to be forty-two years, while the average age at death among the entire population, based upon eight thousand deaths attributed to this cause, was thirty-six years. It is noteworthy in this connection that the death-rate from this disease in all Ireland in the year 1905 was only *204*, the rate among the Irish in this city being almost two and one-half times that in their native country. It is hard to believe, therefore, that this high rate is dependent entirely upon a national predisposition. It is true that we should expect an increase by reason of the comparatively severe climate and the absence of the pure air of the home country, but this is in a measure offset by the more abundant and nutritious food to be had here.

As regards the next cause, cancer and sarcoma, all the natives of foreign countries except Italy and Sweden show a rather high rate, the natives

of the United States showing the lowest rate. Apparently, the contention that excessive meat-eating and the drinking of spirituous liquors are the predisposing factors in the causation of the ever-increasing mortality from this disease is upheld when we consider that the foreign nations, with the exception of the two above mentioned, are in the category of the large meat-eaters; but this conclusion must not be too hastily jumped at, as the age distribution has much to do with the mortality from this disease which does not assume a prominent place in the mortality list until the age of forty has been reached.

In considering the mortality from organic heart disease and chronic Bright's disease, the most remarkable thing to be noted is that every nationality having a high mortality rate from cancer has a correspondingly high rate from these two diseases. A glance at the table will show that this coincidence is very evident. What has been said concerning cancer is true of these two causes also, and, furthermore, it should be borne in mind that these three causes have during the last fifteen years increased to an alarming extent.

Table II, which shows the deaths and rates for the same countries and periods as Table I, is based on the nativities of the *parents* of the deceased. The general death-rate column as compared with that of Table I presents a number of changes; for example, the mortality of those whose parents were born in Italy—that is, Italian-Americans, so-called—reaches the extremely high mark of *3643* per 100,000, or 36.43 per 1,000. The previous table shows that the rate among the native Italians is less than one-half as great. The rate for native Austro-Hungarians, *1660* per 100,000 in Table I gives way to one of *2340* in Table II. On the other hand, the mortality rate of *1849* per 100,000 for native Americans is superseded by a rate of *1398* per 100,000 for the descendants of native Americans; and the rate of the Irish-born, 2926 per 100,000, gives way to that of *2355* among the Irish-Americans. In analyzing these rates, the disturbing element is the fecundity of the different nationalities with its influence upon the mortality rates. Natives of the following countries have comparatively low birth-rates, and consequently their general death-rates in Table II show considerable decreases,—the United States, Ireland, Germany, England, Scotland, British America, Switzerland, France, Bohemia, and Sweden. On the other hand, considerable increases are shown in those nationalities noted for their opposition to the race-suicide tenets, namely, the Italians, Russian-Poles, and Austro-Hungarians. The birth-rates among the natives of these countries domiciled in the city have been exceedingly high (probably 32–35 per 1,000) during the past five years, and in consequence the number of children under five years of age is large compared with the number of children of corresponding age among the other

nationalities, and, as the mortality is very high at these ages, we naturally are not surprised at the resulting high death-rates.

Table II in the main corroborates the deductions drawn from Table I as to the mortality of the different nationalities from the causes specified. Thus in the typhoid fever column, omitting nationalities whereof the number of deaths does not reach twenty, the Italians and Austro-Hungarians have the highest mortality, while under the heading Measles we notice that the Italian children have a mortality rate almost five times that of the entire city. The Italian children show the highest mortality also from scarlet fever and whooping-cough, with the Hebrew children a close second; and neglect of the use of diphtheria antitoxin results in a mortality rate from diphtheria among the Italian children of three times that of all other nationalities combined, while among the Hebrew children the rate is almost twice that of the normal average. The mortality from pulmonary tuberculosis, shown in Table II, exhibits the same general features as in Table I, the Swiss, Irish, French, Bohemians and Scotch having death-rates much higher than the normal average. The rates from cancers, organic heart and chronic Bright's diseases, are all lower in Table II than in Table I. This is doubtless due to the fact that these diseases usually attack only those of middle life and advanced age, while the rates are figured on all ages, including young children as well as adults, thus giving lower mortality figures. Under the rates from broncho-pneumonia the most surprising figures of the whole table appear, the rate among Italian children reaching the enormous height of *710* per 100,000, more than 7½ times as high as that among American children. When we consider under what conditions the Italian families herd together, and the opportunities thus afforded for the spread of contagious and infectious diseases, the difficulties encountered by the sanitary officers can be imagined, but not described. Think of seven tenement houses with a population of 1,500 and of a square block that by actual count harbors 5,100 souls, surrounded by other blocks harboring an average of 2,000, and you obtain an idea of the necessity for eternal vigilance on the part of the health officials. The lobar-pneumonia column affords added proof of the Italian national predisposition to diseases of the respiratory tract. Here the Italian leads, with none of the others a close second. The mortality from the diarrhœal diseases impresses upon the medical profession the necessity of promoting the campaign for pure milk and food, and of using our best efforts to advance the worthy cause of a clean milk supply for our large cities with their teeming tenements. The death-rate from this cause among Italian children is double that of the Austro-Hungarian children, and three times as high as the average for the entire city.

TABLE II.

DEATHS AND DEATH-RATES PER 100,000 ACCORDING TO NATIVITY OF PARENTS OF DECEASED IN OLD CITY OF NEW YORK, 1906.

CAUSES OF DEATH.		POPULATION AND NATIVITY OF PARENTS.														
		Total.	United States.	Ireland.	Germany.	Italy.	Russia-Poland.	England.	Austro-Hungary.	Scotland.	British America.	Switzerland.	France.	Bohemia.	Sweden.	Mixed.
		2,464,432	568,746	426,799	472,431	154,010	206,955	63,576	107,828	21,897	11,631	7,592	14,046	19,222	28,539	309,668
All Causes	Deaths	46,108	7,951	10,049	5,722	5,611	3,763	813	2,523	341	156	144	305	338	313	3,795
	Death-rate	*1871*	*1398*	*2355*	*1213*	*3643*	*1818*	*1279*	*2340*	*1557*	*1341*	*1897*	*2171*	*1759*	*1097*	*1226*
Typhoid Fever	Deaths	369	85	67	50	43	23	8	26	2	2	—	5	2	8	30
	Death-rate	*14.9*	*14.9*	*14.3*	*10.6*	*27.9*	*11.1*	*12.6*	*24.1*	*9.1*	*17.2*	—	*35.6*	*10.4*	*28.0*	*9.7*
Measles	Deaths	662	101	39	20	198	88	2	35	—	—	—	2	6	2	87
	Death-rate	*26.8*	*17.8*	*9.1*	*4.2*	*128.6*	*42.5*	*3.1*	*32.4*	—	—	—	*14.2*	*31.2*	*7.0*	*28.1*
Scarlet Fever	Deaths	212	46	32	9	28	37	1	14	1	—	—	—	—	—	35
	Death-rate	*8.6*	*8.1*	*7.5*	*1.9*	*18.1*	*17.9*	*1.5*	*13.0*	*4.6*	—	—	—	—	—	*11.3*
Whooping-cough	Deaths	202	51	19	11	22	30	4	10	1	—	—	—	—	2	40
	Death-rate	*8.2*	*9.0*	*4.5*	*2.3*	*14.3*	*14.5*	*6.2*	*9.3*	*4.6*	—	—	—	—	*7.0*	*12.9*
Diphtheria	Deaths	983	198	74	42	202	147	11	86	1	1	—	2	6	10	160
	Death-rate	*39.9*	*34.8*	*17.3*	*8.9*	*131.1*	*71.0*	*17.3*	*79.8*	*4.6*	*8.6*	—	*14.2*	*31.2*	*35.0*	*51.7*
Pulmonary Tuberculosis	Deaths	5,900	895	2,018	816	375	261	85	261	63	21	27	55	65	44	457
	Death-rate	*239.4*	*157.4*	*472.8*	*172.7*	*243.4*	*126.3*	*133.7*	*242.0*	*287.7*	*180.6*	*255.7*	*391.6*	*338.2*	*154.2*	*145.6*
Cancers	Deaths	1,856	259	436	416	66	177	64	118	27	10	12	19	27	18	90
	Death-rate	*75.3*	*45.5*	*102.1*	*88.1*	*42.8*	*87.9*	*100.7*	*109.4*	*123.3*	*86.0*	*158.1*	*135.3*	*140.5*	*63.1*	*29.1*
Heart Disease	Deaths	3,506	511	1,042	657	187	257	91	157	39	15	15	29	28	14	229
	Death-rate	*142.3*	*89.9*	*244.1*	*139.0*	*121.4*	*123.5*	*143.1*	*145.6*	*178.1*	*129.0*	*197.6*	*206.5*	*145.7*	*49.1*	*73.9*
Broncho-pneumonia	Deaths	3,379	531	318	164	1,095	328	22	264	13	5	4	11	17	17	312
	Death-rate	*137.1*	*93.4*	*74.5*	*34.7*	*710.0*	*163.8*	*34.6*	*244.8*	*59.4*	*43.0*	*52.7*	*78.3*	*88.4*	*59.6*	*100.8*
Lobar Pneumonia	Deaths	3,303	542	851	403	513	215	68	164	25	16	10	20	16	18	228
	Death-rate	*134.0*	*95.3*	*199.4*	*85.3*	*333.1*	*107.7*	*107.0*	*152.1*	*114.2*	*137.6*	*131.7*	*142.4*	*83.2*	*63.1*	*73.6*
Diarrhœa	Deaths	3,652	803	373	186	745	363	26	280	9	7	7	11	28	27	478
	Death-rate	*148.2*	*141.2*	*87.4*	*39.4*	*483.7*	*182.2*	*40.9*	*259.7*	*41.0*	*60.2*	*92.2*	*78.3*	*145.7*	*94.6*	*154.4*
Chronic Bright's	Deaths	3,232	483	1,091	585	115	161	90	96	37	20	14	28	32	16	175
	Death-rate	*131.2*	*84.9*	*255.6*	*123.8*	*74.6*	*80.7*	*141.6*	*84.0*	*169.0*	*172.0*	*184.4*	*199.3*	*166.5*	*56.1*	*56.1*

TABLE III.

DEATH-RATES PER 1,000 IN CERTAIN TYPICAL BLOCKS, OLD CITY OF NEW YORK, 1906.

Block.	Type.	General Death-rate.	Pulmonary Tuberculosis.	Cancer.	Heart and Bright's.	Lobar Pneumonia.	Broncho-pneumonia.	Diarrhœal Diseases.
A.	Negro	38.56	8.64	0.66	4.66	2.00	5.99	2.66
B.	Syrian	35.83	3.91	1.96	1.30	4.57	3.91	3.91
C.	Chinese	34.65	12.47	0.69	5.54	3.46	0.69	—
D.	Irish	24.64	4.78	—	5.05	0.67	1.91	2.70
E.	Bohemian . .	19.57	4.10	1.82	3.19	—	1.82	1.37
F.	Italian	19.26	0.96	—	1.74	0.96	8.29	2.31
G.	Russian Polish.	17.47	0.83	0.83	1.94	1.94	1.94	1.11
H.	Austro-Hungarian	16.43	1.21	0.72	2.17	1.93	1.93	1.93
I.	German . . .	16.30	1.48	2.22	2.96	—	0.74	1.48
	General rates entire city . .	18.71	2.39	0.75	2.74	1.34	1.37	1.48

The third and last table to which your attention is directed shows the death-rate per 1,000 from certain diseases and all causes in selected blocks typical of some of the nationalities and races. These blocks, situated in congested areas of the city, have populations of from 1,400 to 5,100 persons to the block. The influence of the negro's presence upon the mortality rate is more or less familiar to all, and is clearly shown in the table. The general rate, 38.56 per 1,000, of the selected negro block (A), "San Juan Hill," is more than double that of the city at large, while the rate from pulmonary tuberculosis is three and one-half times as high as the average for the city, and is only exceeded by that of the Chinese block. The mortality from organic heart, chronic Bright's, pneumonial, and diarrhœal diseases, is also excessively high. Throughout the Greater City the mortality among the colored population is 27.16 per 1,000 as against a rate of 18.19 among the whites and a general death-rate of 18.35, the effect of the negro population being to increase the general rate by .16 of a point. The recent addition to our community of the Syrian and Armenian section bids fair to affect detrimentally the mortality rates. The general rate of 35.83 per 1,000 here (B) is almost equal to that of the negro block, and the mortality from cancer, pneumonial and diarrhœal diseases is greater than that among the negroes. The Chinese block (C) contains about 1,450 Chinamen and is noted for its high death-rate from pulmonary tuberculosis as well as for

its unsavory police record. The general rate is 34.65 per 1,000, and the rate from pneumonia is almost as high as that of the Italian block. The Irish block (D) shows a high general death-rate and a high rate in all diseases preponderating at middle or advanced ages. The Bohemian block (E) shows a moderately high general death-rate and excessively high rates from pulmonary tuberculosis and organic heart disease. The Italian block (F) shows a general rate slightly above the average, but the highest rate from the pneumonias. The Russian-Polish block (G) shows a low general rate, with a pneumonia death-rate somewhat above the average. The low rates in this block and among the Jews throughout the city can be ascribed to several causes. Although living in densely populated sections, the Jew by reason of his temperate habits and his inherited vitality is able to resist and overcome infection, or, as has been said, the Jew is physically "tough" in the best sense of the term. Again the present status of the Jew as to age distribution at most age-periods, with the exception of that under five years, is favorable to a low death-rate. The Austro-Hungarian block (H) makes a very presentable showing, the general rate being almost the same as that shown in Table I. The German block (I) shows the lowest general death-rate, the only rate much above the average being that from cancer.

The conclusions forced upon us by the consideration of these tables are that the natives of Ireland by reason, in great measure, of their unfavorable age-grouping increase the general mortality, and the same is also true to a lesser extent of the natives of France, Switzerland, and Scotland. The natives of Italy, Bohemia, and the United States are credited with a rate almost the same as that of the general average of the city, while the natives of Sweden, Germany, Russia-Poland, Austro-Hungary, and England affect favorably the general mortality. On the other hand the immediate descendants of the Irish, Italians, and Austro-Hungarians are instrumental in increasing the general rate, and especially the rates from certain preventable and infectious diseases. The immediate descendants of most of the other nationalities, including Americans, serve to lower the general rate.

APPENDIX C.

PROPOSED RESOLUTIONS (RULES OF STATISTICAL PRACTICE) PRESENTED AT THE FIRST ANNUAL MEETING OF THE AMERICAN PUBLIC HEALTH ASSOCIATION: SECTION ON VITAL STATISTICS, AT ATLANTIC CITY, N.J., SEPT. 30 TO OCT. 4, 1907.

NOTE.—Each proposition should be considered on its merits. It is not to be understood, from the mere fact of presentation, that the Bureau of the Census either does or does not advocate the adoption of any individual item. In some cases, references may be given to accepted modes of treatment or a specific recommendation. However simple and obvious some of the propositions may appear, there is not one of them upon which there is a strict agreement among American official statistical publications at the present time. Hence the necessity for definite decisions.

(1) STATEMENT OF CAUSE OF DEATH.*

1. That a uniform mode of statement of causes of death upon certificates of death shall be adopted by all registration offices in the United States which shall provide, first, in the case of a death from disease, for the name of the DISEASE CAUSING DEATH, and, in the case of a death from violence, for the MEANS OF DEATH, AND WHETHER ACCIDENTAL, SUICIDAL, OR HOMICIDAL; together with such subsidiary information, if any, as may be necessary, under the head of "resulting in" or "aided by."

2. That a continuous and systematic effort be made, through the conjoined action of the local, State, and government authorities, to secure the co-operation of physicians and coroners in the more definite and satisfactory statement of causes of death; and that for this purpose each certificate of death bear a certain minimum amount of suggestions in regard to the statement of cause of death, which shall be uniform throughout the United States, in addition to any special instructions or regulations required for local use.

As a basis for discussion in regard to what this minimum amount shall be, the following draft of suggestions, which can readily be inserted upon the reverse side of any certificate or printed on the inside of the cover of the booklet of blanks supplied to physicians and coroners, has been prepared:—

(DRAFT OF) SUGGESTIONS TO PHYSICIANS AND CORONERS RELATIVE TO THE STATEMENT OF CAUSE OF DEATH.

(Adopted by the American Public Health Association and recommended by the United States Bureau of the Census for the purpose of securing uniformity in returns of deaths throughout the United States.† *Please read carefully.*)

A. *Deaths from disease.*

1. Name, first, the DISEASE CAUSING DEATH. What is wanted is the name of the *disease* (or malformation) itself responsible for the death; *not* a mere secondary, consecutive,

* See full text of census pamphlet No. 107, "Modes of Statement of Cause of Death and Duration of Illness upon Certificates of Death," which is submitted as a part of this recommendation.

† Provided, of course, that any definite instructions can be generally agreed upon.

contributory, or immediate cause, complication, symptom, terminal condition, or mode of death. Never report a death from such "causes" as asphyxia, asthenia, collapse, coma, convulsions, debility, dropsy, exhaustion, heart failure, hypostatic pneumonia, inanition, marasmus, old age, shock, syncope, or weakness, if a definite disease causing the condition can be named. WAS IT PUERPERAL? Always qualify, as *puerperal* convulsions, *puerperal* peritonitis, *puerperal* septicemia, etc., all deaths resulting from childbirth or miscarriage.

2. *Important* secondary affections or independent (concurrent) diseases actually contributing to the death may be named.

Example: Measles (disease causing death); broncho-pneumonia (secondary affection).

B. *Deaths from violence.*

1. Name, first, the MEANS OF DEATH, and whether ACCIDENTAL, SUICIDAL, OR HOMICIDAL; as, *accidental drowning, suicide—carbolic acid; railroad collision.*

NOTE.—In the last example, it is not necessary to write "Accidental," because such cases are *plainly* of that character. A judicial determination of "manslaughter" on account of negligence does not affect the *statistical* character of the return, and a coroner should not delay the filing of the certificate of death on that account.

2. Nature of injury (lesion) or immediate cause of death may be given if not implied under (1).

3. Important *secondary* affections (*e.g.*, erysipelas, septicemia, tetanus) and contributory diseases (*e.g.*, insanity, alcoholism) should always be stated.

As an example of how such data might be provided for with but slight modification of the standard blank, the following form is submitted:—

MEDICAL CERTIFICATE OF DEATH

DATE OF DEATH

.....(Month) .....(Day) 19....(Year)

I attended deceased from.....19....

to.....19....., I last saw h.....alive on

.....19....., and I HEREBY CERTIFY

that death occurred on the date above at.....M. The DISEASE

CAUSING DEATH [*or* ***MEANS OF DEATH**** (Deaths from violence)] was:	Duration in Years, Months, Days, or Hours.
Resulting in:	
or **Aided by:**	

(Signed).....M. D.

.....190.....(Address).....

*State how injury occurred and whether {Accidental? Suicidal? Homicidal?}

Duration.

Enter duration, in years, months, days, *or* hours, after each separate cause of death. Duration of a disease is from its commencement until death occurs; do not merely give time of final illness in chronic diseases. Duration in deaths from violence is from the time of injury or appearance of complication until death.

(2) STATEMENT OF OCCUPATION.

NOTE.—In census pamphlet No. 107, "Modes of Statement of Cause of Death and Duration of Illness upon Certificates of Death," the following statement is made (p. 8):—

"*Occupation.*—While this item should afford some of the most practically useful information derived from mortality statistics, it does not do so at present. A complete study of the subject by an authorized committee, and with the aid of all who are interested in statistics of the mortality of occupations, should be made and an improved schedule formulated, if one not too cumbrous can be devised, that will enable a beginning to be made in the collection of satisfactory material. A form will be submitted merely as a basis of discussion, and so that definitive action *may* be taken in 1908 without waiting another year for the report of the special committee in charge of the subject. It is desirable that all changes in the standard blank be made at the same time. In the meantime it is urged that special attention be given to the subject by statisticians. A symposium on 'Occupations' is planned in the American Statistical Association, in which the requirements of the schedule and instructions on occupations may be discussed from the several points of view of population, industrial (manufactures) and vital statistics."

There is little variety in the form of this question upon certificates of death employed in this country, nearly all of them asking for the simple statement of "Occupation," as in the standard blank:—

OCCUPATION

1. An attempt should be made to secure not only the kind of occupation (*e.g.*, laborer), but also the kind of industry (*e.g.*, pottery).
2. For satisfactory statistics of occupational mortality, it is desirable to know the length of time employed from beginning the occupation until death.
3. In case of a recent change of occupation (————* years before death), it is desirable to know the previous occupation, which may have been the cause of change to a lighter employment and the predisposing cause of death.
4. For persons unemployed it may be important to know the last previous employment (————* years before death), as this may have contributed to invalidism or retirement, and may have been a contributing cause of death.
5. Instructions in regard to the reporting of occupations should be uniform in population, industrial and mortality schedules (certificates of death), and uniform instructions should be prepared for physicians and local registrars, and enforced by State registration offices, on this basis.
6. Occupations should be stated for all decedents over ten years of age (and for decedents under ten years of age if employed in a mill, factory, or in any gainful occupation).
7. For children under ten years of age the occupation of the father (or of mother, if not supported by father) should be obtained on account

* Time limit to be determined.

of the great value of such information for a proper study of infant and child mortality.

NOTE.—If deceased has been employed in above occupation for less than ————* years, please fill out statement of LAST PREVIOUS OCCUPATION on reverse side. The complete and correct statement of occupation is most important, and informants, or physicians, are requested to make a precise statement. Local registrars should see that the blank is properly filled out in this respect.

OCCUPATION (Last gainful occupation; if under 10 years, that of FATHER)

..... From.....

(Kind of work? Trade? Profession?) To.....

(Years only)

.....

(Employed in what **kind** of business, mill, factory? On farm, railroad, etc.)

(3) STATISTICAL DEFINITION OF DEATHS.

1. Total deaths, as stated in mortality reports and bulletins, should include *all deaths* that occurred in the area of the State or city during the specified time.

Still-births.

2. Still-births should not be included in deaths.

NOTE.—Still-births may be *registered*, of course, either separately as still-births, as births or deaths, or preferably as both births and deaths. These rules have no bearing upon the method of collecting the returns, but relate solely to the statistical presentation of the data.

3. Children born alive and *living for any time whatever*, no matter how brief, after birth, should not be classed as still-births, even though reported by the attending physicians or midwives as "Still-born."

4. Whenever age, in days, hours, or minutes, is reported for a "Still-born" child, or indicated by difference between dates of birth and death, the registrar should secure a statement that will enable the case to be classed with certainty either as a still-birth or as a death. If no additional information can be obtained, the statement of age should govern, and the case be compiled as a death, not as a still-birth.

Premature Births.

5. Premature births (not still-born) should be included in total deaths (classified under International Title No. 151).

6. Premature births (still-born) should be classed under still-births and should not be included in total deaths.

7. When a premature birth is reported as "Still-born" and an inconsistent statement of age (days, hours, minutes) is also given, the registrar should endeavor to secure a statement that will enable the case to be classed with certainty either as a still-birth or as a death. If no additional information can be obtained, the statement of age should govern, and the case be compiled as a death, not as a still-birth. (See also following paragraph.)

8. In the above case of inconsistent statement of "Still-born" and

*Time limit to be determined.

age, if the period of utero-gestation is also given and is under seven months, then the case should be classed as a still-birth.

9. When a premature birth is reported with no statement of age (space left blank), the local registrar should endeavor to obtain a statement of age, or at least that the child was born alive; but, in absence of any further data, the case should be compiled as a still-birth.

Deaths of Non-residents.

10. All deaths of transients or non-residents occurring in a State or city should be included in the tables of total deaths.

NOTE.—It is not fair to exclude non-residents *unless* all deaths of residents occurring elsewhere can be included: this is quite impracticable in the United States under present conditions and the large extent of non-registration territory. No rules based on duration of actual residence of transients or nature of cause of death have been generally adopted, so that deaths of a certain character would be uniformly excluded. It is evident that the death of a non-resident of a city who succumbs to typhoid fever after living there long enough for the time to include the duration and period of incubation of the disease should be properly charged to its mortality. On the other hand a death from pulmonary tuberculosis occurring within 1, 2, 3, . . . months after arrival, may not be properly chargeable to the mortality of the State or city. As a provisional method of treatment, the following paragraph is submitted:—

11. A separate column showing "Deaths of non-residents" may be given, which should include deaths in hospitals, institutions, and of transients and non-residents, on whose certificates of death appears a statement of "Former or usual residence," "Where was disease contracted, if not at place of death," and "How long at place of death," the time stated in answer to the last question being *less than six (?) months and less than the duration of the disease causing death.*

NOTE.—The limit of residence is suggested merely as a basis for discussion. Evidently, some line of demarcation should be fixed if it is proposed to treat deaths of non-residents upon a uniform basis. In addition to the duration of the disease causing death, its period of incubation may be considered as a factor of the decision. But, whatever plan is adopted for the special statement of deaths of non-residents, there should be no interference with the complete statement of total deaths, inclusive of all deaths of non-residents, as required by paragraph 10.

Deaths in Institutions.

12. Deaths of residents of a city in a hospital or institution situated within the city limits should be distributed by the local registrar to the districts of residence (borough, ward, sanitary district) as far as possible.

13. Deaths of residents of a city in an institution (*e.g.*, almshouse) situated outside of the city limits, but chiefly or entirely occupied by commitments from the city, should be included in the total deaths of the city, and be distributed by the city registrar to the districts of residence as provided in paragraph 12.

NOTE.—This is suggested for discussion. It apparently departs from the general principle of registering a death where it occurs, and there only. On the other hand it would relieve extra-urban districts containing city institutions from an apparently excessive mortality, enable the true death-rate of the city to be known, and make the statistics more comparable with future years when, with the extension of the city limits, the institution may come to be included in the urban area. The successful accomplishment of such distribution requires co-operation of local registrars, and would evidently be undesirable and

unfair unless all cities included the deaths of their dependent or defective classes on the same basis. A limit of residence might require to be considered.

14. Deaths of inmates of a State or government institution should be included in the total deaths of the areas containing them; but special columns may be employed to permit the separate statement of such deaths, as in the case of non-residents.

NOTE.—The alternative plan of distributing the deaths in a State institution (*e.g.*, insane asylum) to the counties or cities from which the inmates were received may be considered, or the institution may be treated as an independent registration area. In any case, if the deaths are eliminated the constituent population should also be eliminated before computing death-rates.

Deaths on Trains or Vessels.

15. Passengers dying on trains or vessels should be registered as deaths at the station or port where the bodies are removed.

NOTE.—Such cases are few, and the rule is suggested to secure early registration at the nearest practicable point to the place where death occurred. These deaths may be treated as those of non-residents (paragraph 10), and it is desirable that a record, not for statistical purposes, be made at the place of residence.

16. Deaths caused by railroad accidents or by disasters incident to navigation should be registered in the district that includes the place of death or where the bodies were brought ashore.

Deaths at Sea.

17. (Subordinate to 15, 16.) In deaths and burial at sea, or in marine disasters where the bodies are not recovered, the deaths should be registered at the port of embarkation; and for this reason a register should be kept at the shipping office of all sea-going vessels containing the essential particulars concerning each member of the passengers and crew. Such deaths may be separately noted in the statistical tables of the port of embarkation.

Period Covered.

18. Total deaths should include all deaths that occurred in the given area during the period stated in the table, and no others:—

(*a*) A weekly bulletin should include all deaths that occurred during the week ending at 12 P.M., Saturday, and no others.

(*b*) A monthly bulletin should include all deaths that occurred during the calendar month, and no others.

(*c*) An annual report should include all deaths that occurred during the calendar year, and no others.

NOTE.—The basis of compilation should be the occurrence of the deaths, not the time of receipt in the registration office. No allowance or "offsetting" need be made for "delayed returns" in a fully effective administration of a State or city office.

Headings of Tables.

19. Every table of total deaths should explicitly state in its heading that still-births are not included, and, if any classes of deaths are omitted

from a table apparently relating to total deaths, the items excluded should be explicitly stated either in the heading or in a foot-note.

Death-rates Based on Total Deaths.

20. Any statement of the death-rate (general, crude, or gross death-rate) of a State or city should be understood to be based, unless expressly qualified, upon the *total deaths, exclusive of still-births*, and without any omissions of deaths whatsoever.

Viability or Non-viability.

CASE. (Richmond, Va., 1907).—"We have a death certificate in which the cause of death is stated as 'premature birth, non-viable,' and the contributory cause is given as 'typhoid fever (mother).' The doctor states to me that this was a six-months' child that gasped a little for three hours, and that he did not consider the child viable when born. What shall we do with this case? Shall it be counted as a death? If so, we are, of course, entitled to the birth at least, and yet the child is distinctly stated to be non-viable. Have you any rule as to what age children are considered viable?" This case presents some interesting features, and, in order to bring out the general opinion and practice of registration officials, the following proposed ruling is formulated:—

21. Statement of viability or non-viability of an infant prematurely born shall not be considered in classification. The case above should be compiled (paragraph 5) both as a birth and as a death.

NOTE.—With the adoption of improved methods of caring for prematurely born infants (incubator), undoubtedly many lives may be saved that would formerly have been considered "non-viable." The better practice is, as stated by the American Text-book of Obstetrics, vol. ii, p. 387: "It has been customary to fix the period of viability at twenty-eight weeks. As a number of premature infants of twenty-four weeks have successfully been raised, the suggestion that any child that breathes at birth be treated as viable should be adopted in place of any fixed rule based upon the age of the fetus or upon its size."

(4) STATISTICAL DEFINITION OF STILL-BIRTHS.

1. For registration purposes, still-births should include all children born who do not live any time whatever, no matter how brief, after birth.

NOTE.—This definition includes children dead some time before birth, as well as children alive immediately before birth, but who die during the process of birth and before its completion.

2. Birth (completion of birth) is the instant of complete separation of the entire body (not body in the restricted sense of trunk, but the entire organism, including head, trunk, and limbs) of the child from the body of the mother. The umbilical cord need not be cut or the placenta detached in order to constitute complete birth for registration purposes. A child dead or dying a moment before the instant of birth is a still-birth, and one dying a moment, no matter how brief, *after* birth, was a living child, and should not be registered as a still-birth.

3. No child that shows any evidence of life after birth should be registered as a still-birth.

NOTE.—The usual evidence of life is breathing, but beating of heart or any other sign of life after birth should be accepted, as well as the fact of respiration or crying out, to determine that the child was not still-born.

4. Still-births should not be included in tables of births or in tables of deaths. They should be given in separate tables of still-births.

5. Still-births may be registered either (1) with births, (2) with deaths, (3) with both births and deaths, and (4) separately as still-births.

6. Registration as both births and deaths is preferable, in which case the returns should be compared, a correct list of still-births made, and the corresponding certificates eliminated from the births and from the deaths for purposes of compilation.

7. Midwives should not be allowed to sign certificates of still-births.

8. It is not advisable to fix a lower limit of utero-gestation below which still-births need not be registered.

9. For comparative statistical purposes still-births should relate to a definite period of utero-gestation; for example, from the seventh month.

NOTE.—There is evidently no propriety in comparing returns of still-births from a city which registers them as far back as the fifth month with another in which only those after the seventh month are recorded. An effort might be made to secure a complete record, by double registration as birth and death, of all after the seventh month, registering also any cases before the seventh month, but not including them in the ordinary tables of still-births.

10. All birth certificates that may be used for the registration of still-births should provide for the time of utero-gestation, if less than full term.

(See also paragraphs 2 to 9 in preceding section on deaths.)

(5) STATISTICAL DEFINITION OF BIRTHS.

1. "Births" should be used to denote children born alive only, so that it should not be necessary to specify "living births."

2. Whenever, under the foregoing rules, a death should be registered, there should be a corresponding registration, at some previous time, of a birth; and whenever a still-birth is registered, it should be rigorously excluded from both the statistics of births and of deaths.

(See preceding paragraphs relating to deaths and still-births.)

(6) ESSENTIAL REQUIREMENTS FOR REGISTRATION OF DEATHS.

NOTE.—These are merely presented for reindorsement (see Census circular No. 71) and for comparison with the proposed essential requirements for the registration of births.

1. Deaths must be registered immediately after their occurrence.

2. Certificates of death [of standard form] should be required.

3. BURIAL OR REMOVAL PERMITS are essential to the enforcement of the law.

4. Efficient local registrars are necessary.

5. The responsibility for reporting deaths to the local registrars should be fixed.

6. The Central Registration Office should have full control of the local machinery, and its rules should have the effect of law.

7. The transmission and preservation of returns should be provided for.

8. Penalties should be provided [and enforced].*

* The words in brackets have been added.

(7) Essential Requirements for Registration of Births.

1. Births must be registered immediately after their occurrence.
2. Certificates of birth of standard form should be required.
3. Some check is necessary to secure enforcement of the law.
4. Efficient local registrars are necessary.
5. The responsibility for reporting births to the local registrars should be fixed.
6. The Central Registration Office should have full control of the local machinery, and its rules should have the effect of law.
7. The transmission and preservation of returns should be provided for.
8. Penalties should be provided and enforced.

Note.—The character of the check mentioned in paragraph 3 is left for consideration in connection with an analysis of present methods.

(8) Method of Testing Accuracy of Registration of Deaths.

1. The accuracy (completeness with respect to total number) of the registration of deaths in a State may be satisfactorily determined by the proportion found actually registered out of a sufficiently large number (10 per cent. of the total?) derived from any independent source,—*e.g.*, newspaper reports,—and properly distributed throughout the State.
2. Local registrars should regularly note newspaper reports of deaths in order to detect omissions and secure complete registration.

Note.—The Registrar-General of England and Wales in his "General Rules concerning Registration of Births and Deaths" directs that the local registrar "should also systematically consult the announcements of Births and Deaths in the local newspapers."

(9) Method of Testing Accuracy of Registration of Births.

1. The accuracy (completeness with respect to total number) of the registration of deaths in a State may be satisfactorily determined by the proportion found actually registered out of a sufficiently large number (10 per cent. of the total?) derived from any independent source; *e.g.*, newspaper reports or lists of infants registered as deaths, and whose certificates of death enable the place and date of birth to be fixed, provided they are properly distributed throughout the State.

(10) Constitution of Standard Tables of Vital Statistics.

1. Every State or city registration office publishing an annual (or biennial) report should include therein a table showing the population (properly estimated for intercensal years), total number of births exclusive of still-births, total number of deaths exclusive of still-births, total number of still-births, total number of marriages,* and total number of divorces,* for each year of registration.
2. It is desirable that the corresponding rates be given, but the primary figures should be presented whether it is possible to present rates or not.
3. Notes should be given in all instances when discrepant figures have

* Providing these items can be obtained.

been officially printed relative to returns for any year, and the correct figures should be definitely stated.

4. Notes should be given on changes in methods of compiling still-births, and a correct statement of still-births should be established for each year, on the basis of the definitions approved. If necessary, re-examination of the original returns should be made for the purpose of obtaining comparable figures.

(11) Adoption of Uniform Age Periods in Mortality Statistics.

1. In primary or general tables of deaths, ages should be given in quinquennial periods throughout, with subdivision of the first quinquennial period into individual years, except that all ages over one hundred years may be stated in one group.

2. Age periods should always be stated as both inclusive; thus, 5–9 means the years 5, 6, 7, 8, and 9.

3. Unknown ages should never be accepted in returns. The approximate age, according to the best judgment of the reporter, should be given if the exact age is unknown. When accepted by the central registration office, however, they should be given a place in the statement of ages in order to show the imperfect quality of registration.

REVIEW.

Mortality Statistics, 1905. Bureau of the Census, Washington, D.C., 1907.

A compilation of mortality returns can be no more perfect than the sources from which those returns are derived. In short, if the annual reports on Mortality, compiled by the Bureau of the Census, are to be materially improved, the work of improvement must be directed toward a perfecting of the returns made to the Census Office by the various localities or divisions constituting the registration area. So long as the data contained in the mortality volumes of the census are secured through the courtesy of such States and cities as have, by local laws and ordinances, made provision for a fairly accurate and complete recording, or registration, of deaths, the value of the reports of the Bureau of the Census will be largely dependent upon the character of the data voluntarily submitted by the various units of the registration area.

The preliminary work of the Division of Vital Statistics of the Bureau of the Census has, therefore, rightly been largely directed toward two objects,—the extension of the registration area and an improvement in the quality of the returns submitted to it by the various divisions or units of the registration area. That the first object is being attained with at least a fair degree of success is evident by a glance at the map on page 5 and the table on page 7 of the volume on "Mortality Statistics, 1905." In 1906 no less than five States were added to the registration area. These States were California, Colorado, Maryland, Pennsylvania, and South Dakota, and the aggregate population of this extension was nearly ten million in 1900. At the present time nearly one-half, or, to be exact, 48.5 per cent. of the total population of the United States, is included in the registration area. This gratifying progress speaks well for the efficient labors of the permanent Census Office in this direction. Much still remains to be done along this line, however, for no less than thirty-four States and Territories are still without effective registration laws, and, excepting Maryland, the Southern States are unrepresented in the registration area, save by a few scattering cities which together numbered only twenty in 1905. This is particularly unfortunate, because of the large negro population and the pecu-

liar climatic and industrial conditions in the South. There is good reason to believe that the solution of many perplexing problems of public hygiene and sanitation in Southern States and cities would receive a strong impetus if adequate registration laws were generally adopted and effectively enforced throughout the South, or in considerable and representative sections of it.

In the other preliminary labor—the educational work directed toward an improvement in the quality of the statistical returns submitted by the various registration States and cities—the permanent Census Bureau has been scarcely less successful. Much has already been done to bring about uniformity in the classification of causes of death and to establish more perfect harmony and co-operation between the various local registrars and the Census Office. The Census Office is peculiarly fortunate in having as chief statistician of the Division of Vital Statistics a man of long training and wide experience in this kind of educational work. Dr. Cressy L. Wilbur was for several years engaged in a somewhat similar capacity as chief of the Division of Vital Statistics, Department of State, Michigan, and it was principally through his indefatigable efforts that the registration system of Michigan at last became so well organized and the laws so thoroughly enforced that the State was admitted to the registration area in the Twelfth Census.

The outlook for a rapid improvement in the quality of the vital statistics of this country and a more general understanding of the high value and great practical utility of such data was never so bright as at the present time. The annual summary report on Mortality issued by the Census Bureau have at last made it possible for sanitarians, statisticians, and others to make valuable comparisons, carry out special investigations, and to draw conclusions formerly impossible. We may regret that the reports are not as yet so complete as those issued by the Registrar-General of England, for example, but there is strong reason to hope that within a reasonably short time they will equal the English reports in accuracy and excel them in the variety of the statistics which they will contain. The opportunities for the compilation of vital statistics in this country are equalled nowhere else in the world. The United States embraces almost every degree of climate and topography. Its population in the variety of its elements and in the admixtures of its races and nationalities is a marvel of complexities, and the occupations of its people are so nearly all-inclusive that nowhere else in the world can occupation in its relation to disease and mortality be studied more thoroughly or to greater practical purpose.

The present report ("Mortality Statistics, 1905," published in the early part of the current year, 1907) is the sixth annual report and second volume on Mortality published by the Census Bureau. The first

volume contained the first five annual reports. The present report shows some minor improvements in general topography, such as paging and headings in the introductory portion of the volume. The analysis of the fundamental tables is also admirably done. The main features of the statistics are emphasized, and yet the whole analysis is condensed to about forty pages, more than one-half of which are in the form of small illustrative, summary, or analytical supplementary tables. The six summary and rate tables occupy 135 pages and the eight general tables take up 150 pages. A convenient index of six pages completes the volume, which, as a whole, contains 354 pages.

The first general table gives the deaths in each registration area, by color, general nativity, parent nativity, and month of death. This table occupies eighteen pages, nine of which could have been omitted without serious impairment. We cannot concede that the monthly returns of mortality presented in a summary report more than a year after the deaths occurred can serve any but a very limited and doubtful practical purpose. A much more valuable use of the space would have been to give the monthly returns for certain causes of death, such as typhoid fever, malarial fever, diphtheria, etc., where the effect of season *per se* is notable. Monthly returns of the mortality in the aggregate may serve a temporary local purpose in furnishing a barometric-like reading of the general conditions of health and mortality in a city or town, but otherwise their value is so limited as to be practically *nil.*

In general Table 2 the deaths are given for each registration area, by age. This is the only table that gives the age details for each unit of the registration area. For this reason this table might have been extended to about four times its present space, so as to give the age details, with distinction of sex and color. If, because of the small number of the colored in certain cities, it is not worth while to give the information separately for every unit of the registration area, the data should be separated, at least for cities and towns having over five or ten per cent. of colored in their total populations. In certain cities, such as San Francisco, Los Angeles, and San Diego, the Chinese and Japanese should be separately reported in this table.

In general Table 3 the deaths in each registration area from certain causes and classes of causes are given. This is the only table that gives the causes of death in each unit of the registration area, and for this reason the data by sex and by color should be given. The facts presented in this table for such cities as Alexandria, Va., or Key West, Fla., are of very limited value, unless distinction is made of color. The mortality from consumption among negroes, for example, is nearly three times as high as among the white population, and, when the deaths from this cause are given only for the population as a whole in southern cities,

the real facts are not disclosed and the returns are likely to be misleading.

In general Table 4 the deaths are given by age and by sex, color, general nativity, and parent nativity for the registration area, its main subdivisions, and registration States. This table is excellent. The only possible improvement would be to distinguish between the Japanese and Chinese instead of combining them. Ultimately, we may hope to see the statistics given in Tables 2, 3, and 4 carried far enough to distinguish the mortality of at least some of the more important elements of the foreign born. It cannot be too strongly insisted that only in so far as mortality statistics make definite conclusions possible and assist in solving the many problems intimately connected with the health and longevity of the various unit elements of the population will they be of practical value to the sanitarian, the student of public hygiene, the physician, the legislator, or any other interested persons whomsoever.

General Table 5 is a useful summary of the deaths in the registration States from each cause and class of causes. This table is really a somewhat different form of tabulation of the facts shown in Table 3. Table 3 shows the principal causes of death in each unit of registration area, while Table 5 shows each cause of death in only the main divisions of the registration area. Table 4, which relates to age, sex, race, and nativity, without distinction of cause of death, logically should precede Table 3. Such an arrangement would bring all the tables together which deal with the causes of death.

A valid criticism may be directed against Tables 5, 6, 7, and 8, in that the causes of death are arranged in groups of five, without reference to the similarity or dissimilarity of causes within the various groups. While seemingly this is an unimportant matter, in reality it is not so. Any one who has had occasion to make frequent use of the tables will appreciate the criticism. Suicides, for example, should be grouped together instead of being placed in a group of five by different methods, a break, and the four remaining divisions of suicides in another group of five, fractures making up the fifth cause in the second group. From long practical use of such tables my decided preference would be to have the breaks in the table represent real divisions, deaths from cancer, tuberculosis, diseases of the liver, etc., being set off by spaces. This method is the one adopted in the reports of the Registrar-General of England.

General Table 6, which gives the deaths in the registration area as a whole, from each cause and class of causes, by sex and age, is the only table which gives the causes of death with distinction of sex. Sex is one of the primary elements in vital statistics, and this table might be ex-

tended with profit to include at least the main subdivisions of the registration area.

General Table 7 gives the deaths in each registration State from each cause and class of causes, by age. This table might be consolidated with Table 6, the sex being given and the ages by five-year periods instead of by ten-year periods. To facilitate ready comparison and for other purposes, it is advisable to give the ages at death by divisions at least as small as five-year periods.

General Table 8 gives the same facts as Table 7 for registration cities having 100,000 population or over. The ages after ten years are given by ten-year periods and without distinction of sex. The same criticism lies against this table as against Table 7. The essential elements of mortality, age, sex, race, and cause of death, should be given, if possible, for small as well as large cities, and the details should ultimately be given at least for each city of 25,000 population or over.

The main point to keep in mind, it seems to me, is that mortality returns, to be of the greatest value, should be reducible to their lowest terms wherever this is practically possible. We ought, so far as this is possible, to be able to find for any unit of registration area all the essential facts of its mortality, including age, sex, race, nativity, and cause of death. If it is impossible to give the details in combination, then the elements should be given separately for every unit of area, and the facts as to age and cause of death, with distinction of sex and race, should be given for as many as possible of the unit registration areas. Table 1 is an excellent illustration. It would have been improved, however, if instead of twelve columns for deaths by months, two columns had been given to deaths of Chinese and Japanese, and the other ten to deaths among the principal elements of the foreign born. Table 2 is also excellent, but its value would be greatly enhanced if the facts were presented with distinction of race. Table 3, in the same manner, should distinguish race. Table 4, in its general arrangement, is one of the best in the report. Table 5 should follow Table 3, of which it is a summary, or the two tables might readily be consolidated, retaining the best features of each; that is, giving the detailed causes for each unit of area. Table 6 should make distinction of race and possibly a few of the leading foreign-born elements. Tables 7 and 8, too, are of limited value in their present form. The statistics for the District of Columbia in Table 7, and for Baltimore, Md., Los Angeles, Cal., Louisville, Ky., Memphis, Tenn., New Orleans, La., and San Francisco, Cal., in Table 8, are of doubtful value unless distinction is made of race and the age divisions are given by five-year periods.

We understand that the forthcoming report on the Mortality for 1906 will make distinction of color in Tables 7 and 8 for cities of over 100,000

population having 10 per cent. or more of colored population. By colored will be meant Chinese, Japanese, Indians, etc., as well as negroes. Ultimately, these racial elements will probably be separately reported, but for the time being the Census Office prefers to go slowly.

The method of tabulation will not be materially changed until after the first decennium is completed. This course is proper enough in the fundamental tables, but additional facts might easily be presented in the form of supplementary tables. For example, the report for 1907 might deal with the mortality of the Chinese or of the negroes in Northern cities. Tables might easily be compiled which would show the mortality of these races by causes of death, with distinction of age and sex. In another report certain of the more important nativities could be presented in a similar manner. Certain occupations, too, might be taken up, and the mortality analyzed in detail. Such data would be of value even if the number of the living were unknown. The Census Office is in a position to do this special work better than any State or municipal registration office. The Census Office has command of a greater amount of data, it has better facilities for the compilation of statistical tables, and, finally, its reports are more readily accessible to all who are interested in the subjects treated.

In conclusion, I may say that the possibilities of improvement in the census reports on Mortality are largely conditioned by the character of the data which the Census Office is able to secure from the various local registrars, and the space limits of the reports also have to be considered. Finally, a perfect report will be a matter of growth and development as the needs which it meets or fails to meet are thoroughly understood by the local registrars and the Census Office. The criticisms made here are rendered with a full understanding of the various difficulties in the preparation of a summary volume of this kind, and we have only the warmest praise for the general excellence of the mortality volume for 1905.

F. S. Crum.